

above ground storage tank  
air quality  
asbestos/lead-based paint  
baseline environmental assessment  
brownfield redevelopment  
building/infrastructure restoration  
caisson/piles  
coatings  
concrete  
construction materials services  
corrosion  
dewatering  
drilling  
due care analysis  
earth retention system  
environmental compliance  
environmental site assessment  
facility asset management  
failure analyses  
forensic engineering  
foundation engineering  
geodynamic/vibration  
geophysical survey  
geosynthetic  
greyfield redevelopment  
ground modification  
hydrogeologic evaluation  
industrial hygiene  
indoor air quality/mold  
instrumentation  
masonry/stone  
metals  
nondestructive testing  
pavement evaluation/design  
property condition assessment  
regulatory compliance  
remediation  
risk assessment  
roof system management  
sealants/waterproofing  
settlement analysis  
slope stability  
storm water management  
structural steel/welding  
underground storage tank

## **PHASE II ENVIRONMENTAL SITE ASSESSMENT**

### **NORTH CAPITOL AVENUE PARKING LOT AND OLIVER TOWERS SITES LANSING, MICHIGAN**

**SME Project Number 062859.00.005  
January 16, 2012**

### **COOPERATIVE AGREEMENT #BF-00E00384-0**

#### **Prepared for:**

City of Lansing  
Brownfield Redevelopment Authority  
401 South Washington Square, Suite 100  
Lansing, Michigan 48933  
**EPA CA# BF-00E00384-0**



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**Soil and Materials Engineers, Inc.**

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## 1.0 INTRODUCTION

Soil and Materials Engineers, Inc. (SME) prepared this report to present the results of a Phase II Environmental Site Assessment (ESA) conducted on two adjoining parcels, herein referred to as “the Property” or “Oliver Towers Redevelopment”. The general Property location is shown on Figure 1.

The Phase II ESA was funded by the Lansing Brownfield Redevelopment Authority’s (LBRA) Brownfield Assessment Grant from the United States Environmental Protection Agency (U.S. EPA). SME conducted the assessment in accordance with SME’s *Sampling and Analysis Plan* (SAP), dated September 29, 2011, and the U.S. EPA-approved *Quality Assurance Project Plan* (QAPP), dated February 18, 2011. The SAP was approved by U.S. EPA Region 5 prior to implementation.

### 1.1 Property Description and Background

The Property consists of the following two parcels, which are shown on Figure 2.

Parcel Name	Parcel Number	Address	Owner	Size (Acres)	Current Use
North Capitol Avenue Parking Lot	33-01-01-16-177-002	No Address	City of Lansing	1.4	Parking Lot
Oliver Towers	33-01-01-16-177-022	310 North Seymour Avenue	Lansing Housing Commission	1.6	Vacant, 8-story, 101-unit Oliver Towers apartment complex with adjoining one-story office building occupied by the Lansing Housing Commission

SME performed Phase I ESAs of both parcels in September 2011, the results of which were presented in separate Phase I ESA reports dated September 30, 2011. Based on SME’s review of historical information, from at least 1898 to approximately 1970, the North Capitol Avenue Parking Lot parcel (Parking Lot parcel) was used for residential purposes. From approximately 1972 to present, the Parking Lot parcel has been used as a parking lot. Portions of the Oliver Towers parcel were used for residential purposes from at least 1898 until the 1950’s. From approximately 1931 to 1966, various businesses operated on the parcel including two automobile fueling stations, automobile service and repair shops, and a print shop. From approximately 1968 to 1970, the parcel was used as a parking lot. In 1971, the existing Oliver Towers apartment complex was constructed. In 1992, a one-story office addition was added to

the south side of the apartment complex for use by the Lansing Housing Commission. In 2000, the Oliver Towers apartment building was closed due to a fire, but the Lansing Housing Commission continued to occupy the office addition. The approximate locations of the historic structures on the Property, based on Sanborn Fire Insurance maps, are shown on Figure 2.

The Phase I ESA revealed the following recognized environmental conditions (RECs) in connection with the Property:

#### Parking Lot Parcel

- The potential for contaminated fill material on the Property. The environmental condition of material used to backfill the dwellings' basements and/or foundations is unknown. Fill historically used as backfill often included debris and is occasionally found to be contaminated by heavy metals and polynuclear aromatic hydrocarbons. Additionally, soil in and around historic residential structures can contain elevated levels of lead as a result of lead-based paints.
- The potential for migration of contaminated groundwater from nearby sites that have documented contamination or may have undocumented contamination based on the nature of historic operations.

#### Oliver Towers Parcel

- The documented presence of soil contamination on the southeast portion of the Property. Petroleum-impacted soil was encountered during installation of a storm sewer during construction of the Oliver Towers office addition in 1992. The origin of the impacted soil is likely the former automobile fueling station that operated on the southeast corner of the Property.
- The potential for environmental impact on the Property from undetected or unreported releases from former automobile fueling stations and automobile servicing and repair operations. These operations were present along the southern and central portions of the Property from approximately 1931 through approximately 1966. Underground storage tanks were also associated with these operations. No documentation of removal of the underground storage tanks (USTs) was identified; therefore, the potential for abandoned USTs on the Property also exists.
- The potential for contaminated fill material on the Property. The environmental condition of material used to backfill the residential and commercial structures' basements and/or foundations is unknown. Fill historically used as backfill often included debris and is occasionally found to be contaminated by heavy metals and polynuclear aromatic hydrocarbons.
- The potential for migration of contaminated groundwater from nearby sites that have documented contamination or may have undocumented contamination based on the nature of historic operations.



## **1.2 Purpose**

SME performed the Phase II ESA activities to evaluate the RECs identified in the Phase I ESAs and to screen for the presence of contaminants at levels above Michigan Department of Environmental Quality (MDEQ) Part 201<sup>1</sup> Generic Residential Cleanup Criteria. Another purpose of the Phase II ESA was to evaluate environmentally related conditions that could adversely impact future redevelopment of the Property. SME achieved the site assessment goals by conducting the following:

- A geophysical survey was performed to assess the potential for “orphan” USTs and remaining building foundations on portions of the Oliver Towers parcel, and to evaluate whether foundations from historic residential structures remained on portions of the Parking Lot parcel.
- Soil and groundwater samples were collected, analyzed, and evaluated to assess subsurface environmental conditions, particularly fill within the upper four feet that would have the greatest potential to impact future redevelopment on the Property.

SME prepared this report to document sampling procedures and present assessment results and findings.

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<sup>1</sup> Part 201, Environmental Remediation, of the Michigan Natural Resources and Environmental Protection Act (NREPA), PA 451 of 1994, as amended.

## **2.0 SCOPE OF ASSESSMENT AND PROCEDURES**

Procedures for soil boring and sampling activities, temporary monitoring well installation and groundwater sampling, equipment decontamination, quality assurance and quality control, and chemical analyses are summarized in the following subsections.

SME performed the Phase II ESA activities in general accordance with the EPA-approved SAP, with the exception of the following:

- One soil boring (SB21) was added during the investigation to obtain information on the physical properties of soils within the central portion of the Parking Lot parcel. The results were used to support a geotechnical investigation that was also being performed on the Property by SME. The results of the geotechnical investigation were presented in a separate report, and are not included or discussed in this Phase II ESA report.
- On the Parking Lot parcel, a groundwater sample was collected from soil boring SB9 in the central portion of the parcel instead of soil borings along the perimeter of the parcel. This location was selected for groundwater sampling based on the limited presence of groundwater at the Property and the volume of groundwater observed and the likelihood that future subsurface excavation would occur in the central portion of the parcel.
- Due to a decorative brick wall, SME was unable to gain access to the courtyard on the southeast corner of the Oliver Towers parcel. SME needed access to assess the possible UST identified during the geophysical survey. Therefore, soil boring SB11 was advanced with a hand auger instead of the direct-push rig. SME attempted to advance shallow hand augers on and around the suspected UST identified during the geophysical survey; however, SME encountered refusal within the first one foot as a result of tree roots associated with large trees in the courtyard area. SME was able to advance SB11 to approximately four feet below ground surface at one location immediately south of the UST. SME encountered tree roots at approximately four feet below ground surface and abandoned the boring.

## **2.1 Geophysical Survey**

Geosphere, Inc. (Geosphere) of Auburn, Michigan performed a geophysical survey of the Property on October 2 and 3, 2011. The purpose of the geophysical survey was to locate potential orphan USTs and to evaluate the presence of buried foundations and debris. The procedures and equipment used during the survey are detailed in Geosphere's *Report of Geophysical Survey*, dated October 13, 2011 (Appendix A).

## **2.2 Soil Sampling**

SME advanced 21 soil borings (SB1 through SB21) on the Property on October 3, 2011. Except for soil boring SB11, borings were drilled using a hydraulically driven, direct-push Geoprobe® rig mounted on a truck. Soil boring SB11 was intended to further assess impact from the possible presence of a UST identified during the geophysical survey. The courtyard on the southeast corner of the Oliver Towers parcel was not accessible for the Geoprobe® rig due to a decorative brick wall surrounding the courtyard and as such, SB11 was advanced using a hand auger. Borings were advanced to depths between approximately 8 and 16 feet below ground surface, except where refusal was encountered. Soil boring locations are shown on Figure 2.

SME collected soil samples using a four-foot long, two-inch outside-diameter, GeoProbe® Macro-Core® sampler fitted with a single-use, disposable, acetate liner. The soil column in the sample cores was visually evaluated by SME's field representative, and representative samples were collected from each soil unit for visual/manual classification in general accordance with the Unified Soil Classification System (USCS). Descriptions of observed soil conditions are included on SME's Soil Boring Logs in Appendix B.

A portion of each soil sample was used for field screening of ionizable volatile organic compounds (VOCs) using a calibrated photoionization detector (PID) equipped with a 10.6 electronvolt (eV) lamp. Field screening consisted of placing a portion of the sample in a sealed plastic bag and allowing the sample to warm and release ionizable VOCs. The tip of the PID was inserted in the headspace of the bag and PID readings were recorded on SME's Soil Boring Logs.

Unsaturated soil samples were collected from selected borings and submitted for chemical analyses. "Worst case" soil samples were collected from each boring where contamination was evidenced by field screening results and/or chemical odors or staining. If no evidence of contamination was identified based on field screening, chemical odors, or staining, then samples were collected from borings where obvious fill material was encountered. Where fill material was encountered, samples were generally collected within the first four feet of fill material to evaluate potential impacts on future redevelopment activities.

The amount of soil collected for chemical analyses at each sampling location was dependent on chemical analyses requirements. First, soil samples intended for VOC laboratory analysis were removed from the boring liner and were placed in methanol-preserved 40-milliliter (mL) glass vials following U.S. EPA Method 5035A. Soil volumes sufficient for analyses of additional parameters were then removed from the boring liner and homogenized prior to transfer to pre-cleaned, glass jars provided by the analytical laboratory. Soil samples were logged on a chain-of-custody and placed into laboratory-provided sample coolers with ice for transport to the laboratory.

After completion of soil sampling, SME placed the soil cuttings back into the borehole and filled the remainder of the boring to near ground surface with bentonite chips. The ground surface was repaired with asphalt cold patch or topsoil, as appropriate.

### **2.3 Groundwater Sampling**

Groundwater was encountered at depths ranging from 6 feet to 10 feet below ground surface (bgs) at soil borings SB1, SB2, SB4, SB9, and SB16. Groundwater was not encountered at the remaining borings within the depths explored, which ranged from 8 feet to 16 feet bgs except for borings SB11, SB13, and SB14 where refusal was encountered between 4 and 8 feet bgs.

Temporary groundwater monitoring wells were installed at soil borings SB9 and SB16. The monitoring wells were constructed of a five-foot long, one-inch diameter, mill-slotted, pre-packed, PVC screen attached to a one-inch diameter PVC riser. The well was installed such that the screen straddled the encountered water surface. SME purged the well using a variable flow rate, portable, peristaltic pump fitted with new, 3/8-inch outer diameter (OD) polyethylene tubing and 3/8-inch OD silicone tubing, at a low-flow pumping rate of 100 milliliters per minute (mL/min). Purging was continued until the purged groundwater was visibly clear. Insufficient groundwater was present within the temporary well installed at soil boring SB16, therefore, no groundwater sample was collected from that boring location.

After well purging and stabilization, SME collected a groundwater sample from the temporary groundwater monitoring well at SB9. The groundwater sample was transferred directly into pre-preserved, laboratory-supplied containers specific to each analyte group, was logged on a chain-of-custody, and was placed into a laboratory-provided sample cooler with ice for transport to the laboratory.

After completion of groundwater sampling, SME removed the temporary well screens, placed the development water and soil cuttings back into the borehole, and filled the remainder of the boring to near ground surface with bentonite chips. The ground surface was repaired with asphalt cold patch.

#### **2.4 Sampling Quality Assurance and Quality Control (QA/QC)**

In order to minimize cross-contamination during sampling activities, a new pair of disposable nitrile gloves was used for collection and handling of each soil and groundwater sample, new zip top bags were used to screen each soil sample, new acetate liners were used for collection of each direct-push soil sample, and new polyethylene tubing, silicone tubing, and well materials were used for collection of the groundwater sample. Reusable soil sampling equipment (e.g., stainless steel sampling spoon, utility knife, etc.) were decontaminated before and after each use with a phosphate-free, laboratory grade detergent and rinsed with distilled water. Direct-push soil boring equipment was decontaminated using a high pressure, high temperature water wash before the initial soil boring, between borings, and after completion of the soil borings.

SME collected QA/QC samples in general conformance with the requirements and specifications of the project SAP and QAPP. SME collected one field duplicate soil sample to evaluate the precision of sampling activities. SME collected a trip blank sample and a field blank sample to evaluate the potential impacts of cross-contamination associated with sample collection, storage, and transport of soil and groundwater samples. SME collected one matrix spike/matrix spike duplicate (MS/MSD) soil sample to evaluate potential sample matrix interferences on laboratory accuracy and precision.

Field instrument calibration; sample handling and custody requirements; and laboratory analytical methods, analysis reporting limits (RLs), QA/QC procedures and reporting protocols were consistent with those described in the project QAPP.

## **2.5 Chemical Analyses**

SME collected soil and groundwater samples on October 3, 2011. Details of the analyses are described in the following sections.

### **2.5.1 Soil Sample Analyses**

SME submitted 18 soil samples and two (2) QA/QC sample (one duplicate and one MS/MSD) for chemical analyses. The samples were submitted to Fibertec Environmental Services (Fibertec) laboratory of Holt, Michigan for analyses of one or more of the following parameters: VOCs, polynuclear aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and target metals (arsenic, barium, cadmium, chromium, copper, lead, mercury, selenium, silver, and zinc).

Soil samples were analyzed for PAHs and target metals due to the presence of fill. Samples were analyzed for VOCs, PAHs, PCBs, and/or lead in selected soil samples from the Oliver Towers parcel to evaluate potential impact from former automobile fueling stations and automobile servicing and repair operations. Fibertec analyzed the soil samples using the reference methods listed below:

- VOCs – U.S. EPA Method 8260;
- PAHs – U.S. EPA Method 8270;
- PCBs – U.S. EPA Method 8082; and,
- Metals – SW846-6020 (arsenic, barium, cadmium, chromium, copper, lead, selenium, silver, and zinc) / SW846-7470 (mercury).

### **2.5.2 Groundwater Sample Analyses**

SME submitted one (1) groundwater sample and two (2) QA/QC samples (trip blank and field blank) for chemical analyses. The groundwater sample was submitted to Fibertec for analyses of VOCs, PAHs, and target metals (arsenic, barium, cadmium, chromium, copper, lead, mercury, selenium, silver, and zinc). These parameters were selected to evaluate potential impact from fill material and the potential release of petroleum products on the Oliver Towers parcel and other nearby sites. Fibertec analyzed the groundwater samples using the reference methods listed below:

- VOCs – U.S. EPA Method 8260;
- PAHs – U.S. EPA Method 8270; and,
- Metals – SW846-6020 (arsenic, barium, cadmium, chromium, copper, lead, selenium, silver, and zinc) / SW846-7470 (mercury)



### **3.0 RESULTS**

Results of the assessment activities including the geophysical survey, subsurface conditions, and chemical analyses are described in the following subsections.

#### **3.1 Geophysical Survey Summary**

The geophysical survey identified the presence of numerous anomalies, including one feature consistent with an underground storage tank (UST) within a courtyard area on the southeast corner of the Oliver Towers parcel where an automobile fueling station historically operated. The approximate location of the suspected orphan UST is shown on Figures 2 through 4.

SME attempted to confirm the presence of the UST and evaluate soils adjacent to the UST. However, the area was not accessible due to a decorative brick wall surrounding the courtyard. Further, the area of the UST was partially covered by a tree stump and attempts to hand auger around the UST were generally unsuccessful due to the presence of tree roots within the shallow soil.

In addition to the suspected orphan UST, the geophysical survey identified survey responses consistent with fill material across much of the surveyed Property. The survey also identified eleven suspected abandoned utility conduits associated with historic structures on the Property. Refer to Geosphere's report in Appendix A for additional details.

#### **3.2 Surface and Subsurface Conditions**

Soil borings were advanced to depths ranging from 8 feet to 16 feet below ground surface (bgs), except where refusal was encountered. Soil samples were visually classified in general accordance with the Unified Soil Classification System (USCS). Descriptions of soil conditions encountered at each boring are documented on the Soil Boring Logs in Appendix B.

The surface materials encountered at the soil borings generally consisted of approximately 3 to 6 inches of asphalt pavement in the paved portions of the Property, and 3 to 6 inches of sandy topsoil in the unpaved areas at SB10, SB11, SB12, SB15, SB17, and SB19. Fill material consisting of sand or clay with occasional pieces of brick, wood, glass, concrete, and asphalt was observed below the surficial materials across much of the Property to depths ranging from approximately 3 to 9 feet bgs. Additionally, buried concrete (potentially former concrete slabs or foundations) was encountered at SB2 (3.5 to 4 feet bgs) and SB14 (4 to 4.5 feet bgs – drilling refusal encountered). Soil underlying the fill material consisted generally of clay with varying amounts of silt and sand; however, occasional partings to layers of sand were present in

the clay at some locations. A layer of amorphous peat was present from approximately 7 to 7.5 feet bgs at SB3 and SB9, and a layer of sandy fibrous peat with frequent clay seams was present from approximately 7 to 12 feet bgs at SB20.

Petroleum-type odors and field screening results (greater than 5 ppm) were observed at the following three soil borings:

Location	Approximate Depth of Observed Impact (feet below ground surface)	Maximum PID Reading (ppm)
SB12	4 – 12*	4,000
SB17	8 – 14	7,000
SB19	8 – 10	580

\* Positive PID readings and petroleum-type odors were observed at the terminal depth of the boring.

The locations where odors and field screening indicated petroleum impact correspond to locations where automobile fueling stations were historically located. No odors, staining, or elevated PID readings (greater than 5 ppm) were noted at other soil borings drilled on the Property.

Groundwater was encountered at depths ranging from 6 feet to 10 feet bgs at soil borings SB1, SB2, SB4, SB9, and SB16. Groundwater was not encountered at the remaining borings within the depths explored, which ranged from 8 feet to 16 feet bgs except for borings SB11, SB13, and SB14 where refusal was encountered between 4 and 8 feet bgs. The groundwater was observed within shallow fill material or sand on top of the native clayey soils. No evidence of environmental impact (e.g. chemical odors or sheen) was observed within the groundwater encountered.

### **3.3 Chemical Analyses Results**

Results of chemical analyses performed on soil and groundwater samples are summarized in the following subsections. The soil and groundwater sample results were compared to Part 201 Residential Cleanup Criteria to determine if the site qualifies as a Part 201 “facility.” The results for analyses of soil and groundwater samples are presented on Tables 1 and 2. The distribution of soil and groundwater contamination measured at levels exceeding Part 201 Residential Cleanup Criteria is summarized on Figures 3 and 4, respectively. The laboratory analyses reports are included in Appendix C.

### **3.3.1 Soil Analytical Results**

#### **Parking Lot Parcel**

At least one metal was measured in soil samples collected from SB2, SB3, SB4, SB5, SB6, SB7, SB8, and SB9 at concentrations exceeding Part 201 Residential Cleanup Criteria. Concentrations of arsenic, lead, mercury, selenium, and/or zinc exceeded residential drinking water protection (DWP) criteria and/or groundwater surface water interface protection (GSIP) criteria. The concentration of arsenic measured in the soil sample from SB5, and the concentration of arsenic and lead measured in the duplicate soil sample collected from SB6 were at or exceeded the generic residential direct contact criteria (DCC).

Concentrations of PAHs and target metals were measured at some locations at concentrations above their respective reporting limits (RLs), but below Part 201 Residential Cleanup Criteria.

#### **Oliver Towers Parcel**

The concentrations of arsenic, mercury, selenium, and/or zinc measured in soil samples collected from SB14 and SB18 exceeded Part 201 residential DWP criteria and/or GSIP criteria. Additionally, the concentrations of n-butylbenzene; sec-butylbenzene; ethylbenzene; isopropylbenzene; 2-methylnaphthalene; naphthalene; n-propylbenzene; 1,2,3-trimethylbenzene; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; and/or xylenes in soil samples collected from SB12, SB17, and SB19 exceeded Part 201 residential DWP criteria and/or GSIP criteria.

Concentrations of VOCs, PAHs, and target metals were measured in other soil samples at concentrations above their respective RLs, but below Part 201 Residential Cleanup Criteria.

### **3.3.2 Groundwater Analytical Results**

The concentrations of arsenic, barium, copper, and lead measured in the groundwater sample collected from SB9, located on the Parking Lot parcel, exceeded the Part 201 residential drinking water (DW) criteria and/or groundwater surface water interface (GSI) criteria. Zinc was measured at a concentration above its respective RLs, but below Part 201 Residential Cleanup Criteria. No VOCs or PAHs were detected above their respective laboratory RLs in the groundwater sample collected.

No groundwater samples were collected from the Oliver Towers parcel because groundwater was only encountered in one soil boring (SB16) within the depths explored. As noted in Section 2.3, SME attempted to collect a groundwater sample from the boring; however, insufficient groundwater was encountered.

### **3.4 Data Verification/Validation and Usability**

SME evaluated the precision, accuracy, representativeness, completeness, comparability, and sensitivity parameters for the data collected during this Phase II ESA to determine if the data set was valid and of usable quality. Except as described below, results of quality control samples indicated that sample reproducibility and sampling and laboratory analysis functions were within acceptable limits. The laboratory QA/QC results are detailed in the Case Narratives included in Appendix C. Tables 1 and 2 present the analytical results of the field QA/QC samples for soil and groundwater, respectively.

#### **3.4.1 Field QA/QC**

The concentrations of target analytes in the field duplicate soil sample were within field duplicate precision limits specified in the QAPP, with the exception of arsenic, barium, and lead. The overall relative percent difference between the duplicate soil sample and its corresponding sample was outside the field duplicate precision limits specified in the QAPP; therefore, the discrepancy in concentrations of arsenic, barium, and lead indicate that the soil matrix is highly heterogeneous and that concentrations of metals, particularly arsenic, barium, and lead, on the Property are variable. The high variability of metals concentrations is not uncommon within “urban fill.”

No VOCs were detected at concentrations greater than RLs in the trip blank, indicating that VOC contamination was not introduced during sample storage and shipment. Target compounds were also not detected at concentrations greater than RLs in the field blank, further indicating that contamination was not introduced during sample collection, storage, and/or transport.

#### **3.4.2 Laboratory QA/QC**

Except as indicated in Fibertec’s laboratory analytical report, and as described below, applicable laboratory QA/QC sample results were within acceptance limits.

The concentration of anthracene in the laboratory control sample corresponding to soil samples from SB10, SB13, SB14, SB16, and SB20 was below the lower control limit; therefore, anthracene may be biased low in these samples. Anthracene was not detected in soil samples collected from the Property and no PAHs were detected in the above soil samples; therefore, the potentially biased low anthracene did not affect the conclusions of this Phase II ESA.

The laboratory (Fibertec) measures the affects of sample storage, sample handling, sample preparation, and sample analysis on analytical precision through the measurement of relative percent difference (RPD) between laboratory duplicates and matrix-spike (MS) and matrix-spike duplicate (MSD). Fibertec evaluates laboratory accuracy through the use of laboratory control samples, matrix spikes, matrix spike duplicates, and surrogate standards. The percent recovery (%R) of the control sample is used to evaluate how well an analytical method performed for a respective matrix. The results of the MS/MSD results were within acceptable ranges specified in the project QAPP.

#### **3.4.3 Project Objectives and Data Usability**

The data set generated is of usable quality and meets the Property-specific objectives.

#### 4.0 FINDINGS AND CONCLUSIONS

The findings and conclusions of the Phase II ESA conducted on the Property are summarized as follows:

- The Property is a “facility” as defined by Part 201 of the Michigan Natural Resources and Environmental Protection Act (NREPA), PA 451 of 1994, as amended. Soil contamination generally consisted of metals within fill material across the Property, and petroleum on the southwest and southeast corners of the Oliver Towers Parcel. The groundwater collected from soil boring SB9 was also impacted by metals.
- The geophysical survey identified an anomaly consistent with a buried UST on the southeast corner of the Oliver Towers parcel. The geophysical survey also identified numerous abandoned utility lines associated with historic structures on the Property. The presence of an orphan UST on the southeast corner of the Oliver Towers parcel was not confirmed during this Phase II ESA. The area was not accessible due to a decorative brick wall surrounding the courtyard. Further, the area of the UST was partially covered by a tree stump and attempts to hand auger around the UST were generally unsuccessful due to the presence of tree roots within the shallow soil.
- Fill material consisting of sand or clay with occasional pieces of brick, wood, glass, concrete, and asphalt was observed across much of the Property to depths ranging from approximately 3 to 9 feet below ground surface. Additionally, buried concrete (potentially former concrete slabs or foundations) was encountered at several soil boring locations. Evidence of fill was identified during soil boring activities and by the geophysical survey.
- Groundwater was only encountered at only four of the 21 soil boring locations; however, many soil borings did not extend beyond eight feet below ground surface.

The impact of the above findings and conclusion on redevelopment will depend on final redevelopment plans and the nature of Property re-use (e.g. residential versus non-residential).

During the Phase II ESA, arsenic was detected at concentrations exceeding the Part 201 Residential, but not the Nonresidential, direct contact criteria at SB6 on the Parking Lot parcel. However, lead was detected at this location in excess of the Nonresidential criteria. These were



the only detections of chemicals of concern that present a potential health-based risk to future receptors, assuming the groundwater will not be used for potable purposes. The presence of soil impact exceeding the direct contact criteria at only one location may not represent a true exposure to future receptors. Additional soil sampling would be needed to evaluate the actual extent of soil impact around SB6.

Although VOCs were detected at the southeast and southwest portions of the Oliver Towers parcel at concentrations exceeding a groundwater or surface water protection criteria, they did not exceed the soil volatilization to indoor air inhalation criteria. However, a full evaluation of VOC impact and the suspected orphan UST within the courtyard area on the southeast portion of the Oliver Towers parcel was prevented due to access restrictions posed by a decorative brick wall and tree roots that limited SME's ability to advance borings by hand auger.

The soil contamination on the southwest and southeast portions of the Oliver Towers parcel may require further assessment and/or remediation depending on final redevelopment plans. In addition, the impacted soil will have repercussions on soil management during redevelopment and SME should be consulted regarding the requirements.

These findings and conclusions are based on observed conditions during field activities and laboratory analytical results. The area of evaluation for this report was defined by the samples recovered and tested at the sampling locations. In the process of obtaining information in the preparation of this report, procedures were followed that represent reasonable practices and principles in a manner consistent with that level of care and skill ordinarily exercised by members of this profession currently practicing under similar conditions.

Based on the size of the Property and budget limitations, determining the nature and extent of environmental contamination on the Property was not a goal of the Phase II ESA. SME cannot guarantee all potential contaminants have been identified. Undetected contamination resulting from historical activities or off-site sources may be present on the Property.

Report prepared by: Casey E. Smith

Report reviewed by: Brian S. Trent, PE, LEED AP and Keith Egan, Ohio CP#259

## **FIGURES**

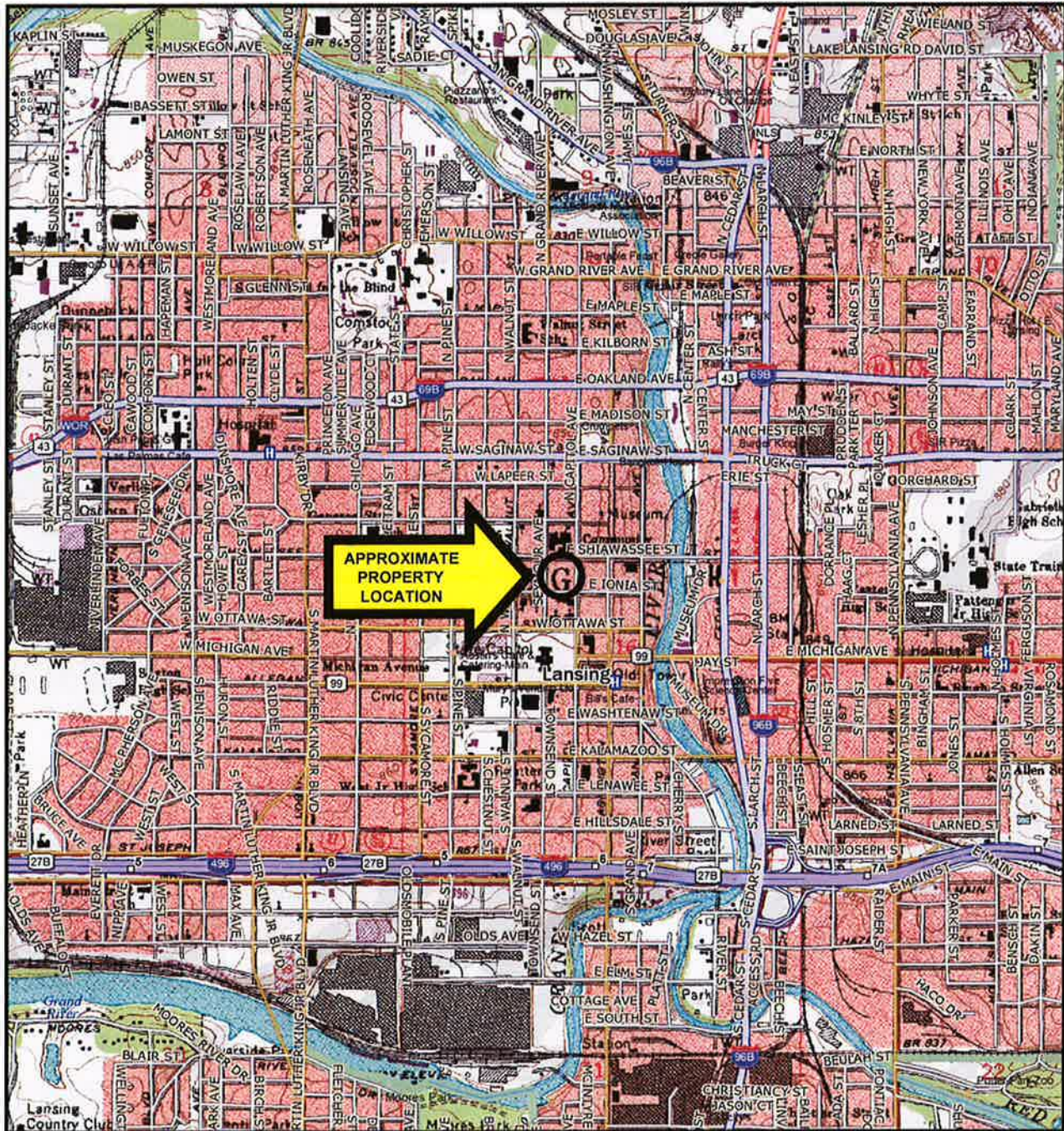
**Figure 1 – Property Location Map**

**Figure 2 – Soil Boring Location Diagram**

**Figure 3 – MDEQ Part 201 Generic Residential Cleanup Criteria Exceedance Diagram -  
Soil**

**Figure 4 – MDEQ Part 201 Generic Residential Cleanup Criteria Exceedance Diagram -  
Groundwater**





Base map obtained from ©DeLorme Topo North America™ 9.



USGS QUADRANGLE(S) REFERENCED  
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Indiana  
Michigan  
Ohio

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Scale	1" = 2000'
Project	062859.00.005

**PROPERTY LOCATION MAP**  
**CITY OF LANSING PARKING LOT**  
**NORTH CAPITOL AVENUE AND**  
**OLIVER TOWERS - 310 NORTH SEYMOUR AVENUE**  
**LANSING, INGHAM COUNTY, MICHIGAN**

Figure No. 1



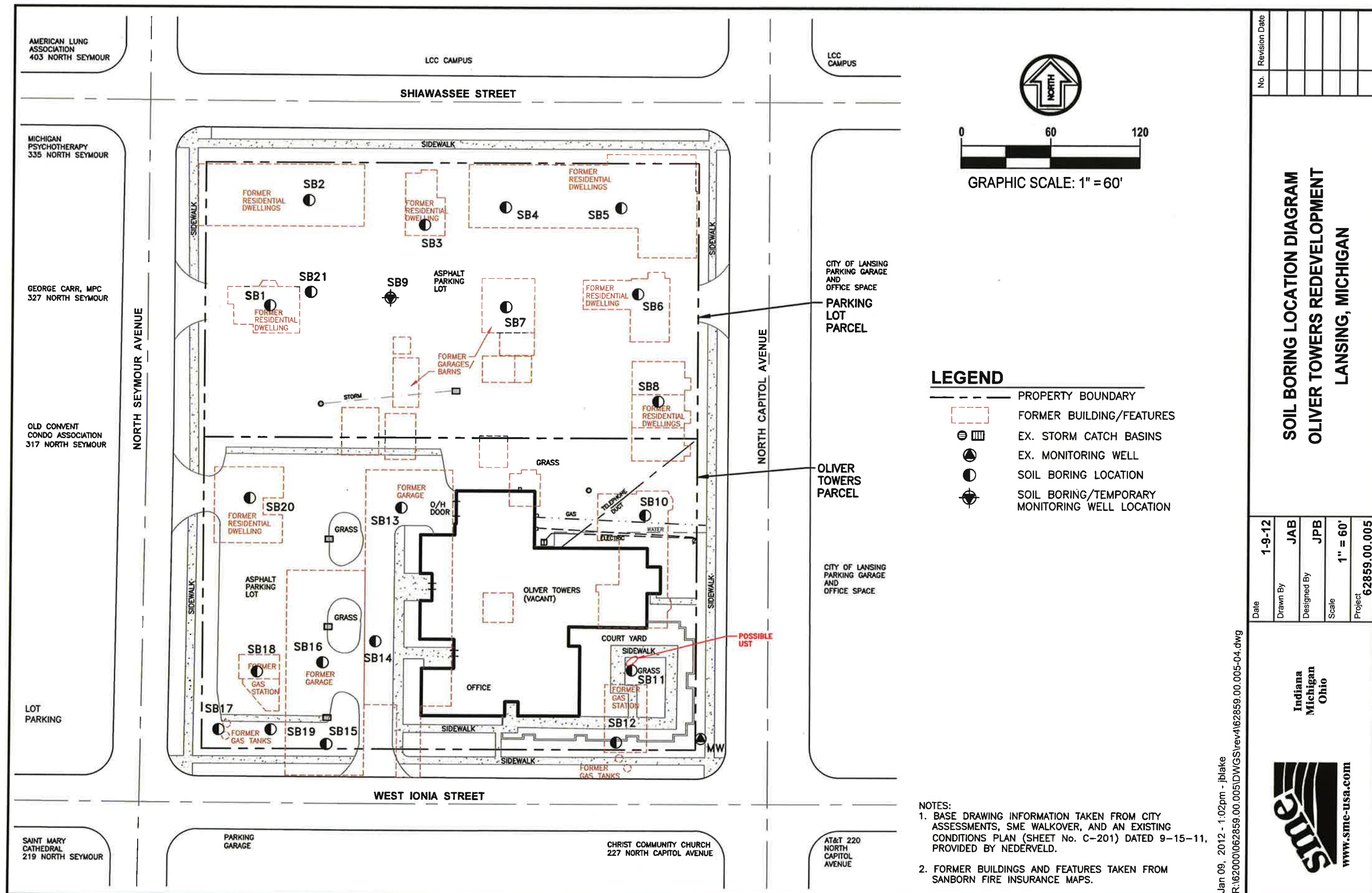
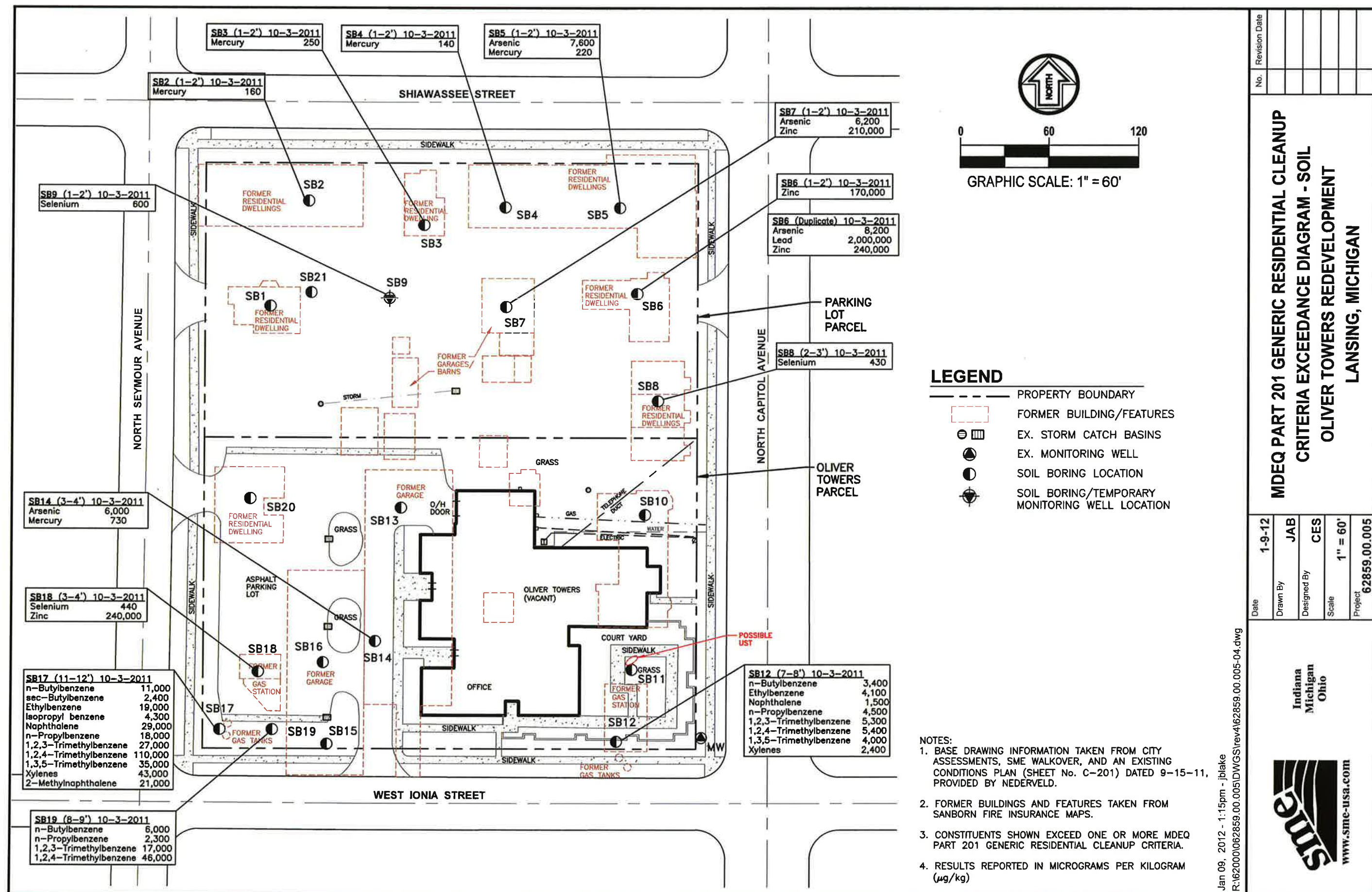
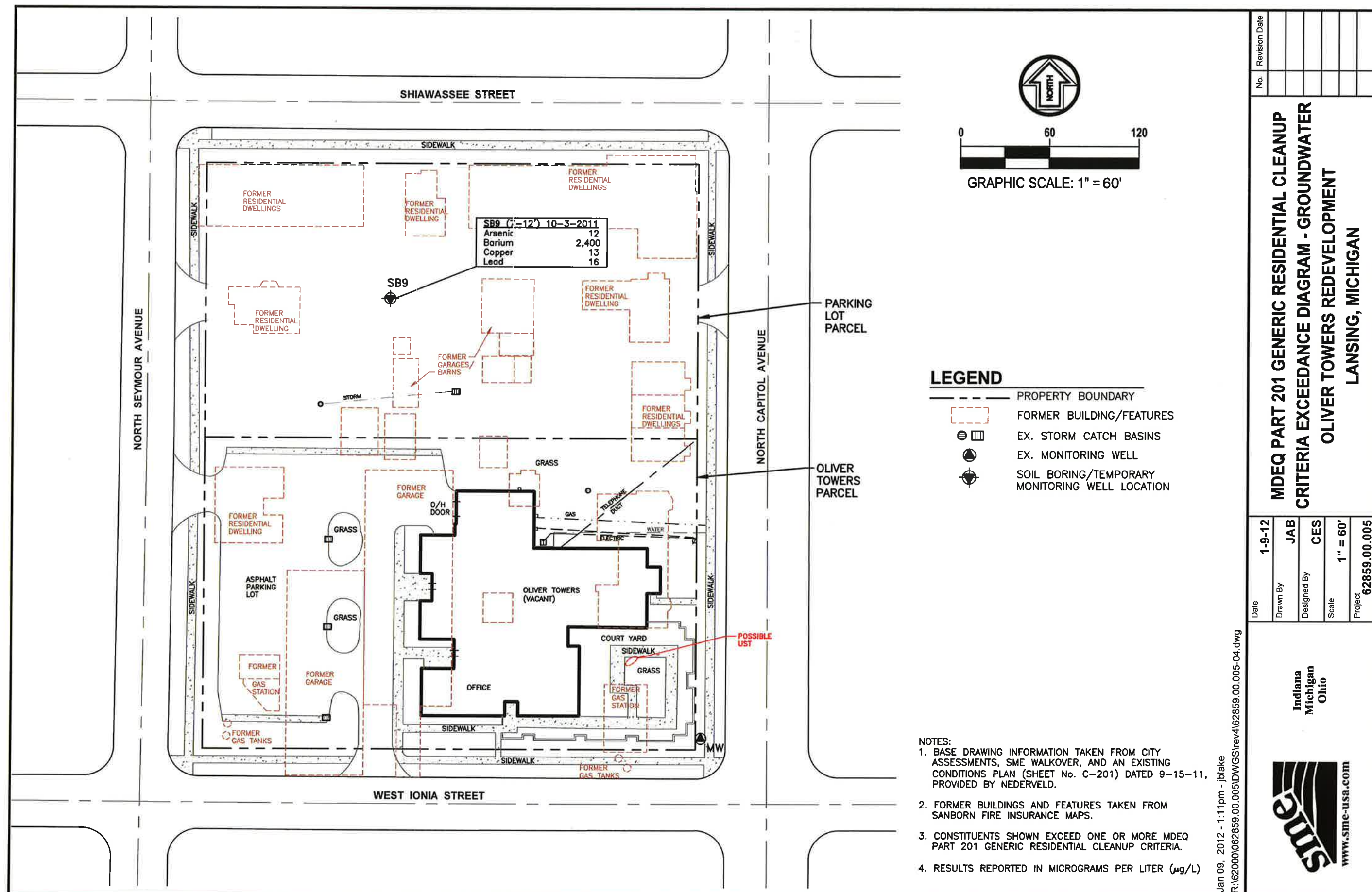


Figure No. 2









## **TABLES**

**Table 1 – Soil Analytical Results**

**Table 2 – Groundwater Analytical Results**

TABLE 1  
SOIL ANALYTICAL RESULTS  
OLIVER TOWERS REDEVELOPMENT - PARKING LOT PARCEL  
LANSING, MICHIGAN

SME PROJECT NO. 062859.00.005  
PAGE 1 OF 2

			Part 201 Generic Residential Cleanup Criteria				Sample ID										
							Depth Below Grade (ft)										
			Rationale for Sample >>>				Date Collected										
Constituent	CAS Number	Statewide Default Background Levels	Drinking Water Protection Criteria	Groundwater Surface Interface Protection Criteria	Soil Volatilization to Indoor Air Inhalation Criteria	Direct Contact Criteria	Evaluate fill material used to backfill basements/foundations when historic residential dwellings were demolished										Spatial distribution
							SB1 2'-3' 10/3/2011	SB2 1'-2' 10/3/2011	SB3 1'-2' 10/3/2011	SB4 1'-2' 10/3/2011	SB5 1'-2' 10/3/2011	SB6 1'-2' 10/3/2011	DUPLICATE SB6 1'-2' 10/3/2011	SB7 2'-3' 10/3/2011	SB8 2'-3' 10/3/2011	SB9 1'-2' 10/3/2011	
PAHs (ug/kg)																	
Benzo(a)anthracene	56-55-3	NA	NLL	NLL	NLV	20,000	<330	<330	<330	<330	<330	490	390	<330	<330	<330	
Benzo(a)pyrene	50-32-8	NA	NLL	NLL	NLV	2,000	<330	<330	<330	<330	<330	370	<330	<330	<330	<330	
Benzo(b)fluoranthene	205-99-2	NA	NLL	NLL	NLV	20,000	<330	<330	<330	<330	<330	520	<330	<330	<330	<330	
Chrysene	218-01-9	NA	NLL	NLL	ID	2,000,000	<330	<330	<330	<330	<330	370	<330	<330	<330	<330	
Fluoranthene	206-44-0	NA	750,000	5,500	1,000,000,000	46,000,000	420	<330	<330	<330	<330	710	<330	<330	<330	<330	
Phenanthrene	85-01-8	NA	56,000	5,300	2,800,000	1,600,000	<330	<330	<330	<330	<330	340	<330	<330	<330	<330	
Pyrene	129-00-0	NA	480,000	ID	1,000,000,000	29,000,000	340	<330	<330	<330	<330	590	<330	<330	<330	<330	
Other PAHs	CS	NA	CS	CS	CS	CS	<RL	<RL	<RL	<RL	<RL	<RL	<RL	<RL	<RL	<RL	
Metals (ug/kg)																	
Arsenic	7440-38-2	5,800	5,800	5,800	NLV	7,600	2,800	4,600	3,300	3,000	7,600	3,200	8,200	6,200	3,900	4,300	
Barium	7440-39-3	75,000	1,300,000	440,000 *	NLV	37,000,000	67,000	83,000	19,000	20,000	34,000	110,000	260,000	120,000	70,000	78,000	
Cadmium	7440-43-9	1,200	6,000	3,600 *	NLV	550,000	440	370	80	88	120	220	320	440	260	320	
Chromium **	16065-83-1	18,000	1,000,000,000	3,000,000,000*	NLV	790,000,000	11,000	13,000	4,200	6,000	5,800	13,000	12,000	11,000	12,000	9,100	
Copper	7440-50-8	32,000	5,800,000	73,000 *	NLV	20,000,000	18,000	15,000	6,200	6,900	6,400	27,000	18,000	16,000	15,000	18,000	
Lead (total)	7439-92-1	21,000	700,000	2,800,000 *	NLV	400,000	130,000	71,000	8,100	800	7,700	270,000	2,000,000	160,000	39,000	86,000	
Mercury	Varies	130	1,700	130	48,000	160,000	<50	160	250	140	220	120	68	<50	110	<50	
Selenium	7782-49-2	410	4,000	410	NLV	2,600,000	240	220	<200	<200	<200	230	390	290	430	600	
Silver	7440-22-4	1,000	4,500	1,000	NLV	2,500,000	240	<100	<100	<100	<100	130	120	140	<100	140	
Zinc	7440-66-6	47,000	2,400,000	170,000 *	NLV	170,000,000	120,000	85,000	21,000	23,000	21,000	170,000	240,000	210,000	82,000	85,000	

- NOTES:
- Concentrations reported in micrograms per kilogram (ug/kg).
  - Criteria taken from RRD Operational Memorandum No. 1, Table 2. Soil: Residential Part 201 Generic Cleanup Criteria and Screening levels, dated March 25, 2011
  - Detected results shown in BOLD. Results exceeding one or more criteria are shaded, as are the criteria exceeded.
  - PAHs = Polynuclear Aromatic Hydrocarbons
  - CS - Criterion or value is specific to individual constituent.
  - <RL - Analytical results for analyzed compounds were below laboratory reporting limit(s).
  - ID - Insufficient data to develop criteria.
  - NLV - Not likely to volatilize.
  - \* = GSI Protection was calculated for the indicated metals using the MDEQ spreadsheet for calculating GSI. A default water hardness value of 150 mg/kg as CaCO3 was used to calculate GSI. Results are presented for surface water receiving bodies not protected as a drinking water source.
  - \*\* Total chromium concentrations were compared to the trivalent chromium criteria; the chromium was not speciated because hexavalent chromium was not a contaminant of concern.
  - Italicized* = the respective criterion was below the Statewide Default Background Level (SDBL) and therefore the value defaulted to the SDBL value.
  - Concentrations were also compared to and found to be below Infinite Source Volatile Soil Inhalation Criteria, Particulate Soil Inhalation Criteria, Groundwater Contact Protection Criteria, and Soil Saturation Concentration Screening Levels.

TABLE 1  
SOIL ANALYTICAL RESULTS  
OLIVER TOWERS REDEVELOPMENT - OLIVER TOWERS PARCEL  
310 NORTH SEYMOUR AVENUE  
LANSING, MICHIGAN

SME PROJECT NO. 062859.00.005  
PAGE 2 OF 2

			Part 201 Generic Residential Cleanup Criteria					Sample ID								
								Depth Below Grade (ft)								
								Date Collected								
			RATIONALE FOR SAMPLE >>>					Potential Fill	Former Auto Fueling Station	Former Auto Garages (Suspected Servicing and Repair)			Former Auto Fueling Station			Potential Fill
Constituent	Chemical Abstract Service Number	Statewide Default Background Levels	Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria	Groundwater Contact Protection Criteria	Soil Volatilization to Indoor Air Inhalation Criteria	Direct Contact Criteria	SB10 1' - 2' 10/3/2011	SB12 7' - 8' 10/3/2011	SB13 1' - 2' 10/3/2011	SB14 3' - 4' 10/3/2011	SB16 1' - 2' 10/3/2011	SB17 11' - 12' 10/3/2011	SB18 3' - 4' 10/3/2011	SB19 8' - 9' 10/3/2011	SB20 2' - 3' 10/3/2011
Volatile Organic Compounds (VOCs)																
n-Butylbenzene	104-51-8	NA	1,600	ID	1.2E+5	ID	2.5E+6	NE	3,400	NE	NE	NE	11,000	NE	6,000	NE
sec-Butylbenzene	135-98-8	NA	1,600	ID	88,000	ID	2.5E+6	NE	1,000	NE	NE	NE	2,400	NE	1,200	NE
tert-Butylbenzene	98-06-6	NA	1,600	ID	1.8E+5	ID	2.5E+6	NE	260	NE	NE	NE	<50	NE	<50	NE
Ethylbenzene	100-41-4	NA	1,500	360	1.4E+5 (C)	87,000	1.4E+5 (C)	NE	4,100	NE	NE	NE	19,000	NE	340	NE
Isopropyl benzene	98-82-8	NA	91,000	3,200	3.9E+5 (C)	3.9E+5 (C)	3.9E+5 (C)	NE	1,300	NE	NE	NE	4,300	NE	330	NE
Naphthalene	91-20-3	NA	35,000	730	2.1E+6	2.5E+5	1.6E+7	NE	1,500	NE	NE	NE	29,000	NE	<1,200	NE
n-Propylbenzene	103-65-1	NA	1,600	ID	3.0E+5	ID	2.5E+6	NE	4,500	NE	NE	NE	18,000	NE	2,300	NE
1,2,3-Trimethylbenzene	526-73-8	NA	1,800	570	94,000	94,000	94,000	NE	5,300	NE	NE	NE	27,000	NE	17,000	NE
1,2,4-Trimethylbenzene	95-63-6	NA	2,100	570	1.1E+5 (C)	1.1E+5 (C)	1.1E+5 (C)	NE	5,400	NE	NE	NE	110,000	NE	46,000	NE
1,3,5-Trimethylbenzene	108-67-8	NA	1,800	1,100	94,000 (C)	94,000 (C)	94,000 (C)	NE	4,000	NE	NE	NE	35,000	NE	1,100	NE
Xylenes	1330-20-7	NA	5,600	820	1.5E+5 (C)	1.5E+5 (C)	1.5E+5 (C)	NE	2,400	NE	NE	NE	43,000	NE	560	NE
Other Analyzed VOCs	CS	NA	CS	CS	CS	CS	CS	NE	<RL	NE	NE	NE	<RL	NE	<RL	NE
Polynuclear Aromatic Hydrocarbons (PAHs)																
Benzo(a)anthracene (Q)	56-55-3	NA	NLL	NLL	NLL	NLV	20,000	<330	<330	<330	<330	<330	<330	<330	<330	<330
2-Methylnaphthalene	91-57-6	NA	57,000	4,200	5.5E+6	2.7E+6	8.1E+6	<330	1,600	<330	<330	<330	21,000	<330	3,000	<330
Other Analyzed PAHs	CS	CS	CS	CS	CS	CS	CS	<RL	<RL	<RL	<RL	<RL	<RL	<RL	<RL	<RL
Polychlorinated Biphenyls (PCBs)																
PCBs	CS	NA	NLL	NLL	NLL	3,000,000	4,000	<RL	NE	<RL	<RL	<RL	NE	NE	NE	<RL
Metals																
Arsenic	7440-38-2	5,800	5,800	5,800	2,000,000	NLV	7,600	1,500	NE	3,000	6,000	2,200	NE	2,500	NE	2,100
Barium	7440-39-3	75,000	1,300,000	440,000*	1,000,000,000	NLV	37,000,000	15,000	NE	18,000	58,000	36,000	NE	90,000	NE	21,000
Cadmium	7440-43-9	1,200	6,000	3,600*	230,000,000	NLV	550,000	64	NE	120	380	110	NE	560	NE	82
Chromium**	7440-47-3	18,000	1,000,000,000	3,000,000,000*	140,000,000	NLV	790,000,000	4,900	NE	4,200	8,500	9,400	NE	8,600	NE	6,100
Copper	7440-50-8	32,000	5,800,000	73,000*	1,000,000,000	NLV	20,000,000	5,400	NE	7,500	31,000	15,000	NE	16,000	NE	3,600
Lead	7439-92-1	21,000	700,000	2,800,000*	ID	NLV	400,000	4,000	6,400	24,000	93,000	46,000	8,200	130,000	8,400	5,300
Mercury	7439-97-6	130	1,700	130	47,000	48,000	160,000	<50	NE	<50	730	<50	NE	80	NE	<50
Selenium	7782-49-2	410	4,000	410	78,000,000	NLV	2,600,000	<200	NE	210	350	<200	NE	440	NE	310
Silver	7440-22-4	1,000	4,500	1,000	200,000,000	NLV	2,500,000	<100	NE	<100	140	<100	NE	160	NE	<100
Zinc	7440-66-6	47,000	2,400,000	170,000*	1,000,000,000	NLV	170,000,000	13,000	NE	24,000	83,000	33,000	NE	240,000	NE	14,000

Notes:

- Concentrations reported in micrograms per kilogram (ug/kg).
- Criteria taken from RRD Operational Memorandum No. 1, Table 2. Soil: Residential Part 201 Generic Cleanup Criteria and Screening levels, dated March 25, 2011
- Detected results shown in BOLD. Results exceeding one or more criteria are shaded, as are the criteria exceeded.
- NE = Not evaluated.
- CS - Criterion or value is specific to individual constituent.
- <RL - Analytical results for analyzed compounds were below laboratory reporting limit(s).
- ID - Insufficient data to develop criteria.
- NLV - Not likely to volatilize.
- \* = GSI Protection was calculated for the indicated metals using the MDEQ spreadsheet for calculating GSI. A default water hardness value of 150 mg/kg as CaCO3 was used to calculate GSI. Results are presented for surface water receiving bodies not protected as a drinking water source.
- \*\* Total chromium concentrations were compared to the trivalent chromium criteria; the chromium was not speciated because hexavalent chromium was not a contaminant of concern.
- Italicized* = the respective criterion was below the Statewide Default Background Level (SDBL) and therefore the value defaulted to the SDBL value.
- Concentrations were also compared to and found to be below Infinite Source Volatile Soil Inhalation Criteria, Particulate Soil Inhalation Criteria, Groundwater Contact Protection Criteria, and Soil Saturation Concentration Screening Levels.



**TABLE 2**  
**GROUNDWATER ANALYTICAL RESULTS**  
**OLIVER TOWERS REDEVELOPMENT - PARKING LOT PARCEL**  
**LANSING, MICHIGAN**

**SME PROJECT NO. 062859.00.005**

**PAGE 1 OF 1**

Constituent	CAS Number	Part 201 Generic Residential Cleanup Criteria				Sample ID		
		Drinking Water Criteria	Groundwater Surface Interface Criteria	Groundwater Volatilization to Indoor Air Inhalation Criteria	Groundwater Contact Criteria	Depth Below Grade (ft)		
						Date Collected		
						SB9-GW 7' - 12' 10/3/2011	TRIP BLANK 10/3/2011	FIELD BLANK 10/3/2011
<b>Volatile Organic Compounds (VOCs)</b>								
VOCs	CS	CS	CS	CS	CS	<RL	<RL	<RL
<b>Polynuclear Aromatic Hydrocarbons (PAHs)</b>								
PAHs	CS	CS	CS	CS	CS	<RL	NE	NE
<b>Metals</b>								
Arsenic	7440-38-2	10	10	NLV	4,300	12	NE	NE
Barium	7440-39-3	2,000	670	NLV	14,000,000	2,400	NE	NE
Cadmium	7440-43-9	5.0	3.0*	NLV	190,000	<1.0	NE	NE
Chromium, Total **	16065-83-1	100	100	NLV	290,000,000	<10	NE	NE
Copper	7440-50-8	1,000	13*	NLV	7,400,000	13	NE	NE
Lead	7439-92-1	4.0	16*	NLV	ID	16	NE	NE
Mercury	Varies	2.0	0.0013	56	56	<0.20	NE	NE
Selenium	7782-49-2	50	5	NLV	970,000	<5.0	NE	NE
Silver	7440-22-4	34	0.2	NLV	1,500,000	<0.20	NE	NE
Zinc	7440-66-6	2,400	170 *	NLV	110,000,000	69	NE	NE

**NOTES:**

- Concentrations reported in micrograms per liter (ug/L).
- Criteria taken from RRD Operational Memorandum No. 1, Table 2. Soil: Residential Part 201 Generic Cleanup Criteria and Screening levels, dated March 25, 2011
- Highlighted concentrations exceed applicable Part 201 Residential Cleanup Criteria
- CS - Criterion or value is specific to individual constituent.
- <RL - Analytical results for analyzed compounds were below laboratory reporting limit(s).
- NE - Not evaluated.
- ID - Insufficient data to develop criterion.
- NLV - Hazardous substance is not likely to volatilize under most conditions.
- \* - Groundwater Surface Water Interface Criterion depends on the water hardness of the receiving water. In accordance with MDEQ Operational Memo No. 5, a water hardness of 100 mg/L is used for the southern lower peninsula of Michigan. The criteria are not protective for surface water that is used as a drinking water source.
- \*\* - Total chromium concentrations were compared to the trivalent chromium criteria; the chromium was not speciated because hexavalent chromium was not a contaminant of concern.

**APPENDIX A**

**GEOPHYSICAL SURVEY REPORT  
GEOSPHERE, INC.  
(OCTOBER 13, 2011)**

13 October 2011

Brian Trent, P.E.  
Soil & Materials Engineers, Inc.  
4705 Clyde Park Avenue, SW  
Grand Rapids, Michigan 49509

**Re: Oliver Towers Redevelopment Project, Lansing, MI: Report of Geophysical Survey**  
**Geosphere Project No. 11-764**  
**SME Task Order No. 1 Task Order dated 09/30/2011**  
**SME Project Number: 062859.00.005**

Dear Brian:

We have completed our analysis and report describing the geophysical survey conducted on 2 and 3 October 2011 at the Oliver Towers Redevelopment Project Site, 310 North Seymour Avenue, Lansing, Michigan (Figures 1.1 and 2.1). The Site occupies the entire city block between North Seymour/Capitol Avenues and West Shiawassee/Ionia Streets. In past decades, two former gas stations operated at the southwest and southeast corners of the block. The multi-story Oliver Towers Building is situated in the eastern part of the south half of the block, surrounded by green space and a small courtyard. A large parking lot exists in the western part of the south half and a very large parking lot occupies the entire northern half of the property; the northern half is currently used by Lansing Community College facility. Sanborn maps indicate that many structures were formerly built over the property, particularly along the periphery.

Detailed coverage was made over most of the accessible area using EM31 and magnetometer instruments with confirmatory radar lines for the detection and location of possible buried tanks, utility lines, and other anomalous subsurface conditions. A central portion of the north lot and the eastern central fence line was not covered. The majority of the survey was done on Sunday when the lots were empty of parked cars.

#### **SITE COVERAGE**

The site grid was constructed using the western side of the west concrete sidewalk and the northern edge of the south sidewalk; the grid origin was defined as 000E/000N in the southwest corner of the property (using Cartesian format). The grid was then expanded to the north and east referenced to these lines (Figure 2.1). Locations of poles, driveways, sidewalks, monitor wells, and other cultural features were also measured and plotted on this map. Geophysical coverage is shown in Figure 3.1. EM/Mag lines were spaced 5 feet apart and data sampled every 2 feet along each line; radar lines were run over unexplained EM31/Mag anomalies.

#### **GEOPHYSICAL SURVEY RESULTS**

**Summary:** The survey results (Figures 4.1 through 4.4) shows eleven unidentified utility pipes (EM) and four unknown tank-like magnetic anomalies. However, only one of these magnetic anomalies has the size and overall characteristics (GPR) expected from a buried tank. It is likely a tank that was abandoned some time ago, as it occurs in the small courtyard southeast of the Towers Building, under a tree stump.



**Details:**

In the EM conductivity results (Figures 4.1), extremely high contour values indicate that considerable fill which contains quantities of electrolytes exists in most of the north lot area and the northern 2/3 of the southwest parking lot. Abnormally high EM values are also mapped in the remaining southern part of the southwest lot and even in the southern and southeastern portions of the green space around the Towers. Such pervasive high conductivities are often caused by multiple decades use of de-icing salts, where the melting components leak through cracks in the asphalt and are absorbed by underlying fill and clay minerals. Old basements of the former structures may have been filled with demolition debris and acted to retain salts leaking through the surface cover.

Linear features observed in Figures 4.1 and 4.2 are interpreted as old utility pipes (probably water) that once served the residences/businesses in block; 11 separate water-like pipes are identified and one current electric line serving the parking lights in the southwest lot. Of particular note is the long linear pipe across the north lot that appears to be missing a segment between grid lines 180E and 230E; perhaps this zone was excavated at a later date. The zone between 145N and 180N on the east side shows the main utility feed to the Towers structure. Concrete pads/sidewalks are also noted particularly in front of the Oliver Towers (west) entrance and in the central part of the southeast courtyard (white stippled contours and dark blue in the inphase metal map).

The magnetic data (Figure 4.3) show a number of large anomalies, however, many strong ones are caused by the large metal guard rails along the sides of the north lot (west, north and east). Others are caused by steel rebar in curbs along the north/south edges of the southwest lot and the indented curb on the west side of the southwest lot as well as the two rounded curbs in front of the Towers. Other smaller and weaker responses are believed to represent iron metal debris in the fill used at the site; iron slag may also been used for fill particularly in the north lot and the north part of the southwest lot.

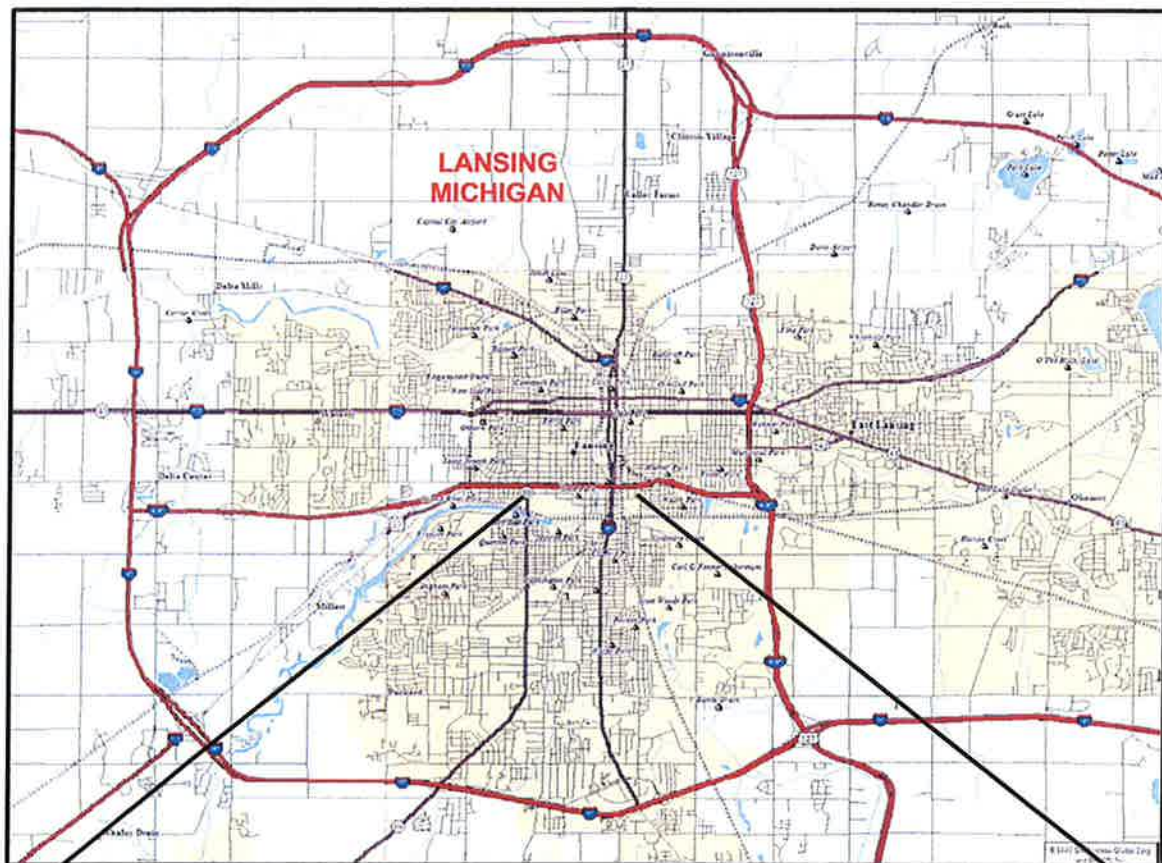
Four tank-like anomalies were found (Figure 4.4), one southwest of the parked car in the southwest lot, a second in the grassy mound south of the curb, a third near the inside corner of the sidewalk (310E/30N) in the courtyard, and a fourth in the courtyard under a stump (305E/65N). Cross-correlation with EM and radar data indicate that the first three Mag anomalies do not have the size and typical characteristics expected of tanks. However, the fourth was also detected by the EM (albeit, small in size) and also by radar. The radar indicates that the buried metal structure is approximately 4 to 5 feet in depth, directly below a tree stump and has the reflection shape of a metal tank.

Results and interpretations in this report are provided on a best possible basis, given the limits of the three techniques and our experience over the past 25+ years. Direct sampling methods should be used to confirm these interpreted features. If you have any questions, please contact me at 989-662-6149 or email [rglaccum@geosphereinc.com](mailto:rglaccum@geosphereinc.com).

Sincerely,



Robert A. Glaccum  
Project Manager

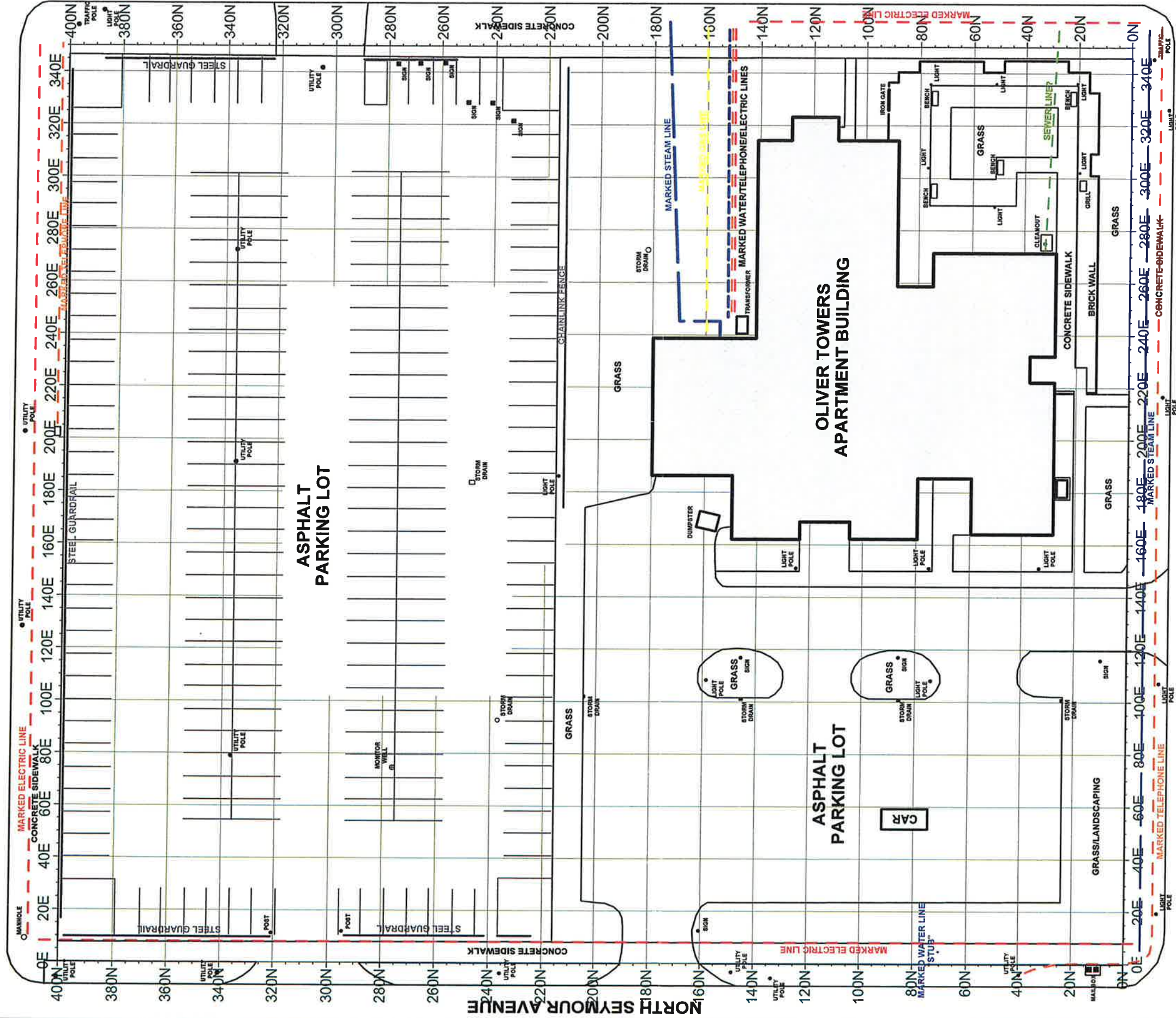


GENERAL SITE LOCATION MAP





WEST SHIAWASSEE STREET



GEOPHYSICAL GRID IN FEET  
(Data collected on lines 5 ft apart, readings every 2 ft)

WEST IONIA STREET

OLIVER TOWERS  
REDEVELOPMENT PROJECT  
310 NORTH SEYMOUR AVENUE  
LANSING, MICHIGAN



MAP SCALE (feet)

GEOSPHERE

10/13/2011

DETAILED SITE MAP  
WITH GEOPHYSICAL  
SURVEY GRID

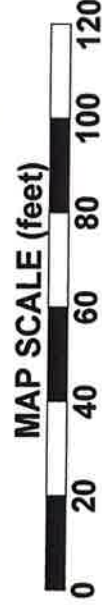
FIGURE 2.1





**GEOPHYSICAL GRID IN FEET**  
(Data collected on lines 5 ft apart, readings every 2 ft)

**WEST IONIA STREET**



**GEOSPHERE**

10/13/2011

## LOCATION OF EM31, MAGNETIC & RADAR SURVEY LINES

### FIGURE 3.1



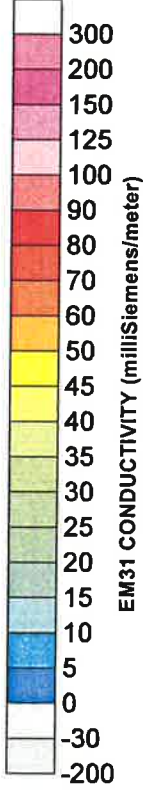


WEST SHIAWASSEE STREET



WEST IONIA STREET

GEOPHYSICAL GRID IN FEET  
(Data collected on lines 5 ft apart, readings every 2 ft)



OLIVER TOWERS  
REDEVELOPMENT PROJECT  
310 NORTH SEYMOUR AVENUE  
LANSING, MICHIGAN

MAP SCALE (feet)



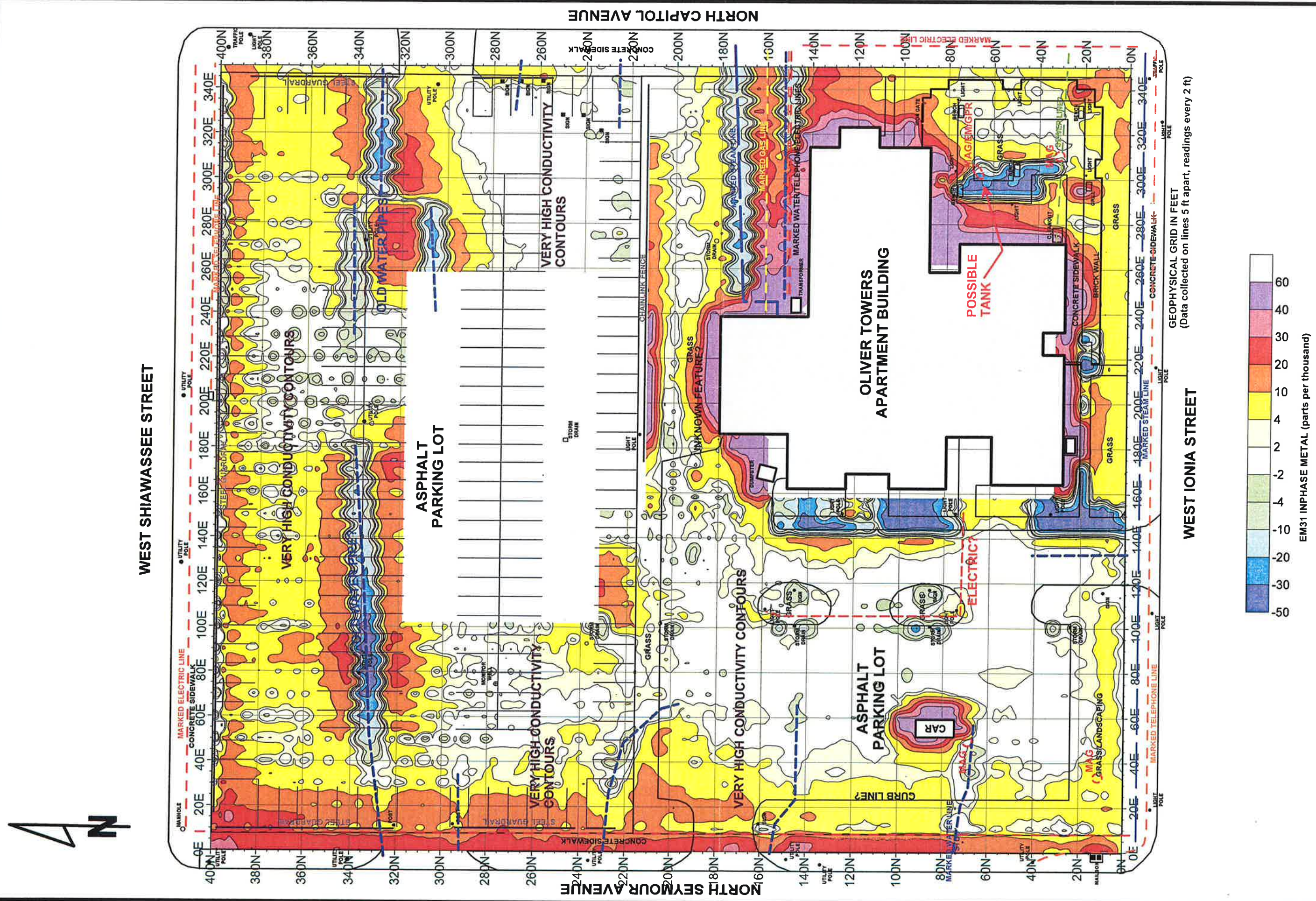
GEOSPHERE

10/13/2011

EM31 CONDUCTIVITY  
CONTOUR MAP WITH  
INTERPRETATION

FIGURE 4.1





**OLIVER TOWERS  
REDEVELOPMENT PROJECT  
310 NORTH SEYMOUR AVENUE  
LANSING, MICHIGAN**

**GEOSPHERE**

10/13/2011

# EM31 INPHASE METAL CONTOUR MAP WITH INTERPRETATION

## FIGURE 4.2









**APPENDIX B**  
**SOIL BORING LOGS**

soil and materials engineers, inc.

**PROJECT NAME:** OLIVER TOWERS REDEVELOPMENT  
**PROJECT LOCATION:** LANSING, MICHIGAN  
**CLIENT:** LANSING BRA

**A/E:** **SOIL BORING SB1**  
**BY:** JPB/BDM **START:** 10/03/11 **END:** 10/3/11  
**PROJECT NUMBER:** 062859.00.005 **SHEET:** 1

DEPTH (FEET)	SYMBOLIC PROFILE	PROFILE DESCRIPTION	SAMPLE TYPE/NUMBER INTERVAL	INCHES OF RECOVERY	BLOWS PER SIX INCHES	PID (ppm)	ANALYTICAL SAMPLE	STANDARD PENETRATION TEST RESISTANCE (N-values) -	NATURAL DENSITY - (pcf)	MOISTURE, % --	ATTERBERG	LIMITS	SHEAR STRENGTH (KSF)	
									90 100 110	0 10 20 30 40	0.0 1.0 2.0 3.0 4.0 5.0			
0		GROUND SURFACE ELEVATION= 847' (+/-)												
		Six Inches of Asphalt Concrete												
		Clayey Fine to Medium Sand- Some Silt- Trace Gravel- Brown- Moist (SC- SM/Fill)	LS1			<1								
2.5		Sandy Clay- Some Silt- Trace Gravel- Occasional Brick Pieces- Brown (CL/Fill)	LS2			<1								
		Fine to Medium Sand- Trace to Some Silt- Trace Gravel- Occasional Wood and Brick Pieces- Brown- Moist (SP-SM/ Fill)	LS3			<1								
5		Silty Clay- Some Sand- Trace Gravel- Brown- Stiff (CL)	LS4			<1								
7.5		Fine to Medium Sand- Trace to Some Silt- Trace Gravel- Brown- Wet (SP-SM)	LS5			<1								
10		Silty Clay- Some Sand- Trace Gravel- Brown- Stiff (CL)	LS6			<1								
12.5		END OF BORING AT 12 FEET.												
15														
17.5														

WATER LEVEL OBSERVATIONS

GROUNDWATER ENCOUNTERED DURING DRILLING

GROUNDWATER ENCOUNTERED  
UPON COMPLETION OF DRILLING

Notes:

1. THE INDICATED STRATIFICATION LINES ARE CONSIDERED APPROXIMATE. IN-SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL.

2. NO ODORS NOTED AND NO STAINING OBSERVED.

3. SURFACE CAPPED WITH COLD PATCH AFTER BACKFILLING THE BOREHOLE.

DRILLER: BJM  
RIG NO.: 274

DRILL METHOD: DIRECT PUSH  
BACKFILL METHOD: SOIL CUTTINGS

WATER LEVEL DURING DRILLING: 8  
WATER LEVEL UPON COMPLETION: NONE

WATER LEVEL                      HOURS AFTER COMPLETION:

CAVE OF BOREHOLE AT





# soil and materials engineers, inc.

PROJECT NAME: OLIVER TOWERS REDEVELOPMENT  
PROJECT LOCATION: LANSING, MICHIGAN  
CLIENT: LANSING BRA

A/E: SOIL BORING SB2  
BY: JPB/BDM START: 10/03/11 END: 10/3/11  
PROJECT NUMBER: 062859.00.005 SHEET: 1

DEPTH (FEET)	SYMBOLIC PROFILE	PROFILE DESCRIPTION	SAMPLE TYPE/NUMBER INTERVAL	INCHES OF RECOVERY	BLOWS PER SIX INCHES	PID (ppm)	ANALYTICAL SAMPLE	STANDARD PENETRATION TEST RESISTANCE (N-values) -	NATURAL DENSITY - (pcf)		MOISTURE, % - ATTERBERG LIMITS		LEGEND				
									90	100	110		HAND PENETROMETER TEST	TORVANE SHEAR TEST	UNCONFINED COMPRESSION TEST	VANE SHEAR TEST	REMOVED VANE SHEAR TRIAXIAL TEST
		GROUND SURFACE ELEVATION= 847.5' (+/-)															
0		Three Inches of Asphalt Concrete															
		Sandy Gravel- Some Silt- Trace Clay- Brown (GW/Fill)	LS1			<1											
2.5		Sandy Clay- Some Silt- Trace Gravel- Occasional Brick Pieces- Brown (CL/Fill)	LS2			<1											
		Six Inches of Concrete															
5		Silty Clay- Some Sand Trace Gravel- Brown- Stiff to Very Stiff (CL)	LS3			<1											
7.5		Fine to Medium Sand- Trace to Some Silt- Trace Gravel- Brown- Moist to Wet (SP-SM)	LS4			<1											
10		Silty Clay- Trace Sand and Gravel- Brown and Gray- Stiff (CL)	LS5			<1											
12.5		END OF BORING AT 12 FEET.	LS6			<1											
15																	
17.5																	
WATER LEVEL OBSERVATIONS			Notes: 1. THE INDICATED STRATIFICATION LINES ARE CONSIDERED APPROXIMATE. IN-SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL. 2. NO ODORS NOTED AND NO STAINING OBSERVED. 3. SURFACE CAPPED WITH COLD PATCH AFTER BACKFILLING THE BOREHOLE.														
GROUNDWATER ENCOUNTERED DURING DRILLING GROUNDWATER ENCOUNTERED UPON COMPLETION OF DRILLING																	

DRILLER: BJM

DRILL METHOD: DIRECT PUSH

WATER LEVEL DURING DRILLING: 8.5

WATER LEVEL

HOURS AFTER COMPLETION:

RIG NO.: 274

BACKFILL METHOD: SOIL CUTTINGS

WATER LEVEL UPON COMPLETION: NONE

CAVE OF BOREHOLE AT



# soil and materials engineers, inc.

PROJECT NAME: OLIVER TOWERS REDEVELOPMENT  
PROJECT LOCATION: LANSING, MICHIGAN  
CLIENT: LANSING BRA

A/E: SOIL BORING SB3  
BY: JPB/BDM START: 10/03/11 END: 10/3/11  
PROJECT NUMBER: 062859.00.005 SHEET: 1

DEPTH (FEET)	SYMBOLIC PROFILE	PROFILE DESCRIPTION	SAMPLE TYPE NUMBER INTERVAL	INCHES OF RECOVERY	BLOWS PER SIX INCHES	PID (ppm)	ANALYTICAL SAMPLE	STANDARD PENETRATION TEST RESISTANCE (N-values) -	NATURAL DENSITY - (pcf)	MOISTURE, % - ATTERBERG LIMITS	LEGEND ▽ HAND PENETROMETER TEST ⊠ TORVANE SHEAR TEST ⊡ UNCONFINED COMPRESSION TEST ⊗ VANE SHEAR TEST ⊕ REMOLDED VANE SHEAR ⊖ TRIAXIAL TEST SHEAR STRENGTH (KSF)
0		GROUND SURFACE ELEVATION= 847' (+/-)									
0		Three Inches of Asphalt Concrete									
		Sandy Gravel- Some Silt- Trace Clay- Brown (GW/Fill)	LS1			<1					
2.5		Silty Fine to Medium Sand- Trace Gravel- Occasional Brick Pieces between 2 and 2.5 feet- Brown- Moist (SM/Fill)	LS2			<1					
5		Silty Fine to Medium Sand- Trace Gravel- Occasional Clayey Sand Seams- Brown- Moist (SM/Fill)	LS3			<1					
7.5		Sandy Amorphous Peat- Black (Pt)	LS4			<1					
		Silty Organic Clay- Gray- Medium (CL)									
10		Sandy Clay- Some Silt- Trace Gravel- Frequent Fine Sand Seams and Partings- Gray and Brown- Stiff to Medium (CL)	LS5			<1					
			LS6			<1					
12.5		Silty Clay- Some Sand and Gravel- Frequent Sand Seams- Brown- Very Stiff (CL)	LS7			<1					
15			LS8			<1					
17.5		END OF BORING AT 16 FEET.									
WATER LEVEL OBSERVATIONS			Notes: 1. THE INDICATED STRATIFICATION LINES ARE CONSIDERED APPROXIMATE. IN-SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL. 2. NO ODORS NOTED AND NO STAINING OBSERVED. 3. GROUNDWATER WAS NOT ENCOUNTERED. 4. SURFACE CAPPED WITH COLD PATCH AFTER BACKFILLING THE BOREHOLE.								
<div>  GROUNDWATER ENCOUNTERED DURING DRILLING   GROUNDWATER ENCOUNTERED UPON COMPLETION OF DRILLING </div>											

DRILLER: BJM

DRILL METHOD: DIRECT PUSH

WATER LEVEL DURING DRILLING: NONE

WATER LEVEL

HOURS AFTER COMPLETION:

RIG NO.: 274

BACKFILL METHOD: SOIL CUTTINGS

WATER LEVEL UPON COMPLETION: NONE

CAVE OF BOREHOLE AT





# soil and materials engineers, inc.

PROJECT NAME: OLIVER TOWERS REDEVELOPMENT  
PROJECT LOCATION: LANSING, MICHIGAN  
CLIENT: LANSING BRA

A/E: SOIL BORING SB4  
BY: JPB/BDM START: 10/03/11 END: 10/3/11  
PROJECT NUMBER: 062859.00.005 SHEET: 1

DEPTH (FEET)	SYMBOLIC PROFILE	PROFILE DESCRIPTION	SAMPLE TYPE/NUMBER INTERVAL	INCHES OF RECOVERY	BLOWS PER SIX INCHES	PID (ppm)	ANALYTICAL SAMPLE	STANDARD PENETRATION TEST RESISTANCE (N-values) -	NATURAL DRY DENSITY -- (pcf)	MOISTURE, % -	LEGEND
									90 100 110	ATTERBERG -- LIMITS	HAND PENETROMETER TEST TORVANE SHEAR TEST UNCONFINED COMPRESSION TEST VANE SHEAR TEST REMOLDED VANE SHEAR TRIAXIAL TEST
0		GROUND SURFACE ELEVATION= 847' (+/-)									
0		Three Inches of Asphalt Concrete									
0		Sandy Fine Gravel- Some Silt- Trace									
0		Gravel- Brown (GP/Fill)	LS1			<1					
2.5		Silty Fine Sand- Trace Gravel- Brown- Moist (SM/Fill)	LS2			<1					
5		Silty Fine to Medium Sand- Frequent Dark Brown Sand Layers- Frequent Brick Fragments- Brown- Moist (SM/Fill)	LS3			<1					
7.5		Fine to Medium Sand- Some Silt- Trace Gravel- Frequent Silty Clay Seams- Gray- Moist (SM/Fill)	LS4			<1					
7.5		Clayey Fine Sand- Some Silt- Frequent Wood Pieces- Black- Moist to Wet (SC/ Fill)	LS5			<1					
10		Fine to Medium Sand- Some Silt- Trace Gravel- Brown- Moist (SM)	LS6			<1					
12.5		Sandy Clay- Some Silt- Trace Gravel- Brown and Gray- Frequent Fine Sand Seams and Partings (CL)									
12.5		END OF BORING AT 12 FEET.									
15											
17.5											

WATER LEVEL OBSERVATIONS

GROUNDWATER ENCOUNTERED DURING DRILLING

GROUNDWATER ENCOUNTERED  
UPON COMPLETION OF DRILLING

Notes: 1. THE INDICATED STRATIFICATION LINES ARE CONSIDERED APPROXIMATE. IN-SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL.

2. NO ODORS NOTED AND NO STAINING OBSERVED.

3. SURFACE CAPPED WITH COLD PATCH AFTER BACKFILLING THE BOREHOLE.

DRILLER: BJM  
RIG NO.: 274

DRILL METHOD: DIRECT PUSH  
BACKFILL METHOD: SOIL CUTTINGS

WATER LEVEL DURING DRILLING: 7.5  
WATER LEVEL UPON COMPLETION: NONE

WATER LEVEL  
CAVE OF BOREHOLE AT  
HOURS AFTER COMPLETION:



# soil and materials engineers, inc.

PROJECT NAME: OLIVER TOWERS REDEVELOPMENT

A/E:

SOIL BORING SB5

PROJECT LOCATION: LANSING, MICHIGAN

BY: JPB/BDM

START: 10/03/11

END: 10/3/11

CLIENT: LANSING BRA

PROJECT NUMBER: 062859.00.005

SHEET: 1

DEPTH (FEET)	SYMBOLIC PROFILE	PROFILE DESCRIPTION	SAMPLE TYPE/NUMBER INTERVAL	INCHES OF RECOVERY BLOWS PER SIX INCHES	PID (ppm)	ANALYTICAL SAMPLE	STANDARD PENETRATION TEST RESISTANCE (N-values) --	NATURAL DENSITY -- (pcf)	MOISTURE, % --	LIMITS	LEGEND						
								90 100 110	ATTERBERG		HAND PENETROMETER TEST TORVANE SHEAR TEST UNCONFINED COMPRESSION TEST VANE SHEAR TEST REMOLDED VANE SHEAR TRIAXIAL TEST	SHEAR STRENGTH (KSF)					
											0.0	1.0	2.0	3.0	4.0	5.0	
0		GROUND SURFACE ELEVATION= 847' (+/-)															
		Three Inches of Asphalt Concrete															
		Sandy Gravel- Some Silt- Trace Clay- Brown (GW/Fill)	LS1		<1												
2.5			LS2		<1												
		Silty Fine Sand- Trace Gravel- Occasional Clay Seams and Wood Pieces- Brown- Moist (SM/Fill)	LS3		<1												
5			LS4		<1												
7.5			LS5		<1												
		Clayey Fine Sand- Some Silt- Trace Gravel- Brown (SC)	LS6		<1												
10																	
12.5		END OF BORING AT 12 FEET.															
15																	
17.5																	

**WATER LEVEL OBSERVATIONS**

GROUNDWATER ENCOUNTERED DURING DRILLING

GROUNDWATER ENCOUNTERED UPON COMPLETION OF DRILLING

**Notes:**

1. THE INDICATED STRATIFICATION LINES ARE CONSIDERED APPROXIMATE. IN-SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL.
2. NO ODORS NOTED AND NO STAINING OBSERVED.
3. GROUNDWATER WAS NOT ENCOUNTERED.
4. SURFACE CAPPED WITH COLD PATCH AFTER BACKFILLING THE BOREHOLE.

DRILLER: BJM

DRILL METHOD: DIRECT PUSH

WATER LEVEL DURING DRILLING: NONE

WATER LEVEL

HOURS AFTER COMPLETION:

RIG NO.: 274

BACKFILL METHOD: SOIL CUTTINGS

WATER LEVEL UPON COMPLETION: NONE

CAVE OF BOREHOLE AT



**A/E:** **SOIL BORING SB6**  
**BY:** JPB/BDM **START:** 10/03/11 **END:** 10/3/11  
**PROJECT NUMBER:** 062859.00.005 **SHEET:** 1

DRILLER: BJM	DRILL METHOD: DIRECT PUSH	WATER LEVEL DURING DRILLING: NONE	WATER LEVEL	HOURS AFTER COMPLETION:
RIG NO.: 274	BACKFILL METHOD: SOIL CUTTINGS	WATER LEVEL UPON COMPLETION: NONE	CAVE OF BOREHOLE AT	





# soil and materials engineers, inc.

PROJECT NAME: OLIVER TOWERS REDEVELOPMENT  
PROJECT LOCATION: LANSING, MICHIGAN  
CLIENT: LANSING BRA

A/E: SOIL BORING SB7  
BY: JPB/BDM START: 10/03/11 END: 10/3/11  
PROJECT NUMBER: 062859.00.005 SHEET: 1

DEPTH (FEET)	SYMBOLIC PROFILE	PROFILE DESCRIPTION	SAMPLE TYPE/NUMBER INTERVAL	INCHES OF RECOVERY	BLOWS PER SIX INCHES	PID (ppm)	ANALYTICAL SAMPLE	STANDARD PENETRATION TEST RESISTANCE (N-values) -	NATURAL DENSITY - (pcf)			MOISTURE, % - ATTERBERG LIMITS			LEGEND																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
									90	100	110	0	10	20	30	40	0.0	1.0	2.0	3.0	4.0	5.0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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DRILLER: BJM

DRILL METHOD: DIRECT PUSH

WATER LEVEL DURING DRILLING: NONE

WATER LEVEL

HOURS AFTER COMPLETION:

RIG NO.: 274

BACKFILL METHOD: SOIL CUTTINGS

WATER LEVEL UPON COMPLETION: NONE

CAVE OF BOREHOLE AT





# soil and materials engineers, inc.

PROJECT NAME: OLIVER TOWERS REDEVELOPMENT  
PROJECT LOCATION: LANSING, MICHIGAN  
CLIENT: LANSING BRA

A/E: SOIL BORING SB8  
BY: JPB/BDM START: 10/03/11 END: 10/3/11  
PROJECT NUMBER: 062859.00.005 SHEET: 1

DEPTH (FEET)	SYMBOLIC PROFILE	PROFILE DESCRIPTION	SAMPLE TYPE/NUMBER INTERVAL	INCHES OF RECOVERY BLOWS PER SIX INCHES	PID (ppm)	ANALYTICAL SAMPLE	STANDARD PENETRATION TEST RESISTANCE (N-values) --	NATURAL DENSITY -- (pcf)	MOISTURE, % --	ATTERBERG	LIMITS	LEGEND							
								90 100 110	0 10 20 30 40	0.0 1.0 2.0 3.0 4.0 5.0	HAND PENETROMETER TEST	TORVANE SHEAR TEST	UNCONFINED COMPRESSION TEST	VANE SHEAR TEST	REMOVED VANE SHEAR	TRIAxIAL TEST			
0		GROUND SURFACE ELEVATION= 847' (+/-)																	
0		Three Inches of Asphalt Concrete																	
2.5		Clayey Fine Sand- Some Silt- Trace Gravel- Brown and Dark Brown- Moist (SC/Fill)	LS1		<1														
2.5			LS2		<1														
5			LS3		<1														
7.5		Sandy Clay- Some Silt- Trace Gravel- Occasional Sand Seams- Brown (CL)	LS4		<1														
10			LS5		<1														
12.5		END OF BORING AT 12 FEET.	LS6		<1														
15																			
17.5																			

WATER LEVEL OBSERVATIONS

GROUNDWATER ENCOUNTERED DURING DRILLING

GROUNDWATER ENCOUNTERED UPON COMPLETION OF DRILLING

Notes: 1. THE INDICATED STRATIFICATION LINES ARE CONSIDERED APPROXIMATE. IN-SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL.

2. NO ODORS NOTED AND NO STAINING OBSERVED.

3. GROUNDWATER WAS NOT ENCOUNTERED.

4. SURFACE CAPPED WITH COLD PATCH AFTER BACKFILLING THE BOREHOLE.

DRILLER: BJM

DRILL METHOD: DIRECT PUSH

WATER LEVEL DURING DRILLING: NONE

WATER LEVEL

HOURS AFTER COMPLETION:

RIG NO.: 274

BACKFILL METHOD: SOIL CUTTINGS

WATER LEVEL UPON COMPLETION: NONE

CAVE OF BOREHOLE AT



# soil and materials engineers, inc.

PROJECT NAME: OLIVER TOWERS REDEVELOPMENT  
PROJECT LOCATION: LANSING, MICHIGAN  
CLIENT: LANSING BRA

A/E: SOIL BORING SB9  
BY: JPB/BDM START: 10/03/11 END: 10/3/11  
PROJECT NUMBER: 062859.00.005 SHEET: 1

DEPTH (FEET)	SYMBOLIC PROFILE	PROFILE DESCRIPTION	SAMPLE TYPE/NUMBER INTERVAL	INCHES OF RECOVERY	BLOWS PER SIX INCHES	PID (ppm)	ANALYTICAL SAMPLE	STANDARD PENETRATION TEST RESISTANCE (N-values) --	NATURAL DENSITY -- (pcf)		MOISTURE, % -- ATTERBERG LIMITS		LEGEND																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
									90	100	110	0	10	20	30	40	0.0	1.0	2.0	3.0	4.0	5.0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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DRILLER: BJM

DRILL METHOD: DIRECT PUSH

WATER LEVEL DURING DRILLING: 10

WATER LEVEL

HOURS AFTER COMPLETION:

RIG NO.: 274

BACKFILL METHOD: SOIL CUTTINGS

WATER LEVEL UPON COMPLETION: NONE

CAVE OF BOREHOLE AT



# soil and materials engineers, inc.

PROJECT NAME: OLIVER TOWERS REDEVELOPMENT  
PROJECT LOCATION: LANSING, MICHIGAN  
CLIENT: LANSING BRA

A/E: SOIL BORING SB10  
BY: JPB/BDM START: 10/03/11 END: 10/3/11  
PROJECT NUMBER: 062859.00.005 SHEET: 1

DEPTH (FEET)	SYMBOLIC PROFILE	PROFILE DESCRIPTION	SAMPLE TYPE/NUMBER INTERVAL	INCHES OF RECOVERY	BLOWS PER SIX INCHES	PID (ppm)	ANALYTICAL SAMPLE	STANDARD PENETRATION TEST RESISTANCE (N-values) -	NATURAL DENSITY - (pcf)	MOISTURE, % - ATTERBERG LIMITS	LEGEND	
									90 100 110	0 10 20 30 40	0.0 1.0 2.0 3.0 4.0 5.0	0.0 1.0 2.0 3.0 4.0 5.0
0		GROUND SURFACE ELEVATION= 846' (+/-)										
0		Three Inches of Sandy Topsoil										
2.5		Fine to Medium Sand- Trace to Some Silt- Trace Gravel- Brown- Moist (SP- SM/Fill)	LS1			<1						
5		Clayey Fine to Medium Sand- Some Silt- Trace Gravel- Occasional Wood Pieces- Dark Brown- Moist (SC/Fill)	LS2			<1						
7.5			LS3			<1						
10		Silty Clay- Trace Sand and Gravel- Occasional Sand Seams- Brown (CL)	LS4			<1						
12.5		END OF BORING AT 12 FEET.	LS5			<1						
15			LS6			<1						
17.5												

**WATER LEVEL OBSERVATIONS**

GROUNDWATER ENCOUNTERED DURING DRILLING

GROUNDWATER ENCOUNTERED UPON COMPLETION OF DRILLING

**Notes:**

1. THE INDICATED STRATIFICATION LINES ARE CONSIDERED APPROXIMATE. IN-SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL.
2. NO ODORS NOTED AND NO STAINING OBSERVED.
3. GROUNDWATER WAS NOT ENCOUNTERED.

DRILLER: BJM  
RIG NO.: 274

DRILL METHOD: DIRECT PUSH  
BACKFILL METHOD: SOIL CUTTINGS

WATER LEVEL DURING DRILLING: NONE  
WATER LEVEL UPON COMPLETION: NONE

WATER LEVEL  
CAVE OF BOREHOLE AT  
HOURS AFTER COMPLETION:





# soil and materials engineers, inc.

PROJECT NAME: OLIVER TOWERS REDEVELOPMENT  
PROJECT LOCATION: LANSING, MICHIGAN  
CLIENT: LANSING BRA

A/E: SOIL BORING SB11  
BY: JPB/BDM START: 10/03/11 END: 10/3/11  
PROJECT NUMBER: 062859.00.005 SHEET: 1

DEPTH (FEET)	SYMBOLIC PROFILE	PROFILE DESCRIPTION	SAMPLE TYPE/NUMBER INTERVAL	INCHES OF RECOVERY	BLOWS PER SIX INCHES	PID (ppm)	ANALYTICAL SAMPLE	STANDARD PENETRATION TEST RESISTANCE (N-values) -	NATURAL DENSITY -- (pcf)		MOISTURE, % - ATTERBERG LIMITS		LEGEND	
									90	100	110	0	10	20
0		GROUND SURFACE ELEVATION= 846' (+/-)												▽ HAND PENETROMETER TEST ○ TORVANE SHEAR TEST □ UNCONFINED COMPRESSION TEST × VANE SHEAR TEST ◇ REMOLDED VANE SHEAR ◇ TRIAXIAL TEST
0		Four Inches of Sandy Topsoil												
2.5		Fine to Medium Sand- Trace to Some Silt- Trace Gravel- Brown- Moist (SP- SM/Fill)	S1			<1								
4.0		END OF BORING AT 4 FEET (REFUSAL ENCOUNTERED).	S2			<1								
5.0														
7.5														
10.0														
12.5														
15.0														
17.5														

**WATER LEVEL OBSERVATIONS**

▽ GROUNDWATER ENCOUNTERED DURING DRILLING

▽ GROUNDWATER ENCOUNTERED UPON COMPLETION OF DRILLING

**Notes:** 1. THE INDICATED STRATIFICATION LINES ARE CONSIDERED APPROXIMATE. IN-SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL.  
2. NO ODORS NOTED AND NO STAINING OBSERVED.  
3. GROUNDWATER WAS NOT ENCOUNTERED.

DRILLER: BJM

DRILL METHOD: HAND AUGER

WATER LEVEL DURING DRILLING: NONE

WATER LEVEL

HOURS AFTER COMPLETION:

RIG NO.: 274

BACKFILL METHOD: SOIL CUTTINGS

WATER LEVEL UPON COMPLETION: NONE

CAVE OF BOREHOLE AT





# soil and materials engineers, inc.

PROJECT NAME: OLIVER TOWERS REDEVELOPMENT  
PROJECT LOCATION: LANSING, MICHIGAN  
CLIENT: LANSING BRA

A/E: SOIL BORING SB12  
BY: JPB/BDM START: 10/03/11 END: 10/3/11  
PROJECT NUMBER: 062859.00.005 SHEET: 1

DEPTH (FEET)	SYMBOLIC PROFILE	PROFILE DESCRIPTION	SAMPLE TYPE/NUMBER INTERVAL	INCHES OF RECOVERY	BLOWS PER SIX INCHES	PID (ppm)	ANALYTICAL SAMPLE	STANDARD PENETRATION TEST RESISTANCE (N-values) -		NATURAL DENSITY - (pcf)	MOISTURE, % -	ATTERBERG	LIMITS	LEGEND					
								90	100	110	0	10	20	30	40	0.0	1.0	2.0	3.0
0		GROUND SURFACE ELEVATION= 846' (+/-)												▽ HAND PENETROMETER TEST ○ TORVANE SHEAR TEST □ UNCONFINED COMPRESSION TEST × VANE SHEAR TEST ◇ REMOLDED VANE SHEAR ⊕ TRIAXIAL TEST					
0		Three Inches of Sandy Topsoil												SHEAR STRENGTH (KSF)					
2.5		Fine to Medium Sand- Trace to Some Silt- Trace Gravel- Occasional Clay Layers- Brown- Moist (SP-SM/Fill)	LS1			0													
5			LS2			0													
7.5			LS3			60													
10		Silty Clay- Trace Sand and Gravel- Occasional Sand Seams- Brown (CL)	LS4			4000													
12.5		END OF BORING AT 12 FEET.	LS5			200													
15			LS6			12													
17.5																			

WATER LEVEL OBSERVATIONS

▽ GROUNDWATER ENCOUNTERED DURING DRILLING

▽ GROUNDWATER ENCOUNTERED UPON COMPLETION OF DRILLING

Notes: 1. THE INDICATED STRATIFICATION LINES ARE CONSIDERED APPROXIMATE. IN-SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL.

2. ODORS NOTED BETWEEN 6 AND 10 FEET BELOW GRADE. NO STAINING OBSERVED.

3. GROUNDWATER WAS NOT ENCOUNTERED.

DRILLER: BJM

DRILL METHOD: DIRECT PUSH

WATER LEVEL DURING DRILLING: NONE

WATER LEVEL

HOURS AFTER COMPLETION:

RIG NO.: 274

BACKFILL METHOD: SOIL CUTTINGS

WATER LEVEL UPON COMPLETION: NONE

CAVE OF BOREHOLE AT



**A/E:** **SOIL BORING SB13**  
**BY:** JPB/BDM **START:** 10/03/11 **END:** 10/3/11  
**PROJECT NUMBER:** 062859.00.005 **SHEET:** 1

DRILLER: BJM	DRILL METHOD: DIRECT PUSH	WATER LEVEL DURING DRILLING: NONE	WATER LEVEL	HOURS AFTER COMPLETION:
RIG NO.: 274	BACKFILL METHOD: SOIL CUTTINGS	WATER LEVEL UPON COMPLETION: NONE	CAVE OF BOREHOLE AT	



# soil and materials engineers, inc.

PROJECT NAME: OLIVER TOWERS REDEVELOPMENT  
PROJECT LOCATION: LANSING, MICHIGAN  
CLIENT: LANSING BRA

A/E: SOIL BORING SB14  
BY: JPB/BDM START: 10/03/11 END: 10/3/11  
PROJECT NUMBER: 062859.00.005 SHEET: 1

DEPTH (FEET)	SYMBOLIC PROFILE	PROFILE DESCRIPTION	SAMPLE TYPE/NUMBER INTERVAL	INCHES OF RECOVERY	BLOWS PER SIX INCHES	PID (ppm)	ANALYTICAL SAMPLE	STANDARD PENETRATION TEST RESISTANCE (N-values) -	NATURAL DENSITY - (pcf)	MOISTURE, % - ATTERBERG	LIMITS	LEGEND					
									90 100 110	0 10 20 30 40		<input type="checkbox"/> HAND PENETROMETER TEST <input type="checkbox"/> TORVANE SHEAR TEST <input type="checkbox"/> UNCONFINED COMPRESSION TEST <input type="checkbox"/> VANE SHEAR TEST <input type="checkbox"/> REMOLDED VANE SHEAR <input type="checkbox"/> TRIAXIAL TEST	SHEAR STRENGTH (KSF)				
									0 10 20 30 40	0 10 20 30 40		0.0	1.0	2.0	3.0	4.0	5.0
0		GROUND SURFACE ELEVATION= 845' (+/-)															
		Three Inches of Asphalt Concrete															
		Nine Inches of Aggregate Base Material	LS1					<1									
2.5		Clayey Fine to Medium Sand- Some Silt- Trace Gravel- Occasional Brick Pieces- Dark Brown (SC/Fill)	LS2					<1									
		Six Inches of Concrete															
5		END OF BORING AT 4.5 FEET (REFUSAL ENCOUNTERED).															
7.5																	
10																	
12.5																	
15																	
17.5																	

**WATER LEVEL OBSERVATIONS**

☐ GROUNDWATER ENCOUNTERED DURING DRILLING  
☐ GROUNDWATER ENCOUNTERED  
 UPON COMPLETION OF DRILLING

**Notes:**

1. THE INDICATED STRATIFICATION LINES ARE CONSIDERED APPROXIMATE. IN-SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL.
2. NO ODORS NOTED AND NO STAINING OBSERVED.
3. GROUNDWATER WAS NOT ENCOUNTERED.
4. SURFACE CAPPED WITH COLD PATCH AFTER BACKFILLING THE BOREHOLE.

DRILLER: BJM

DRILL METHOD: DIRECT PUSH

WATER LEVEL DURING DRILLING: NONE

WATER LEVEL

HOURS AFTER COMPLETION:

RIG NO.: 274

BACKFILL METHOD: SOIL CUTTINGS

WATER LEVEL UPON COMPLETION: NONE

CAVE OF BOREHOLE AT





# soil and materials engineers, inc.

PROJECT NAME: OLIVER TOWERS REDEVELOPMENT

A/E:

SOIL BORING SB15

PROJECT LOCATION: LANSING, MICHIGAN

BY: JPB/BDM

START: 10/03/11

END: 10/3/11

CLIENT: LANSING BRA

PROJECT NUMBER: 062859.00.005

SHEET: 1

DEPTH (FEET)	SYMBOLIC PROFILE	PROFILE DESCRIPTION	SAMPLE TYPE/NUMBER INTERVAL	INCHES OF RECOVERY	BLOWS PER SIX INCHES	PID (ppm)	ANALYTICAL SAMPLE	STANDARD PENETRATION TEST RESISTANCE (N-values) -	NATURAL DENSITY - (pcf)	MOISTURE, % -	ATTERBERG	LIMITS	LEGEND					
									90 100 110	0 10 20 30 40	0.0 1.0 2.0 3.0 4.0 5.0	HAND PENETROMETER TEST	TORVANE SHEAR TEST	UNCONFINED COMPRESSION TEST	VANE SHEAR TEST	REMOVED VANE SHEAR	TRIAXIAL TEST	
0		GROUND SURFACE ELEVATION= 845' (+/-)																
0		Six Inches of Sandy Topsoil																
2.5		Fine Sand- Some Silt- Trace Gravel- Brown- Moist (SM/Fill)	LS1			<1												
5			LS2			<1												
7.5		Silty Clay- Trace Sand and Gravel- Occasional Sand Seams- Brown (CL)	LS3			<1												
10			LS4			<1												
12.5		END OF BORING AT 12 FEET.	LS5			<1												
15			LS6			<1												
17.5																		

**WATER LEVEL OBSERVATIONS**

☐ GROUNDWATER ENCOUNTERED DURING DRILLING  
☐ GROUNDWATER ENCOUNTERED UPON COMPLETION OF DRILLING

**Notes:**

1. THE INDICATED STRATIFICATION LINES ARE CONSIDERED APPROXIMATE. IN-SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL.
2. NO ODORS NOTED AND NO STAINING OBSERVED.
3. GROUNDWATER WAS NOT ENCOUNTERED.

DRILLER: BJM

DRILL METHOD: DIRECT PUSH

WATER LEVEL DURING DRILLING: NONE

WATER LEVEL

HOURS AFTER COMPLETION:

RIG NO.: 274

BACKFILL METHOD: SOIL CUTTINGS

WATER LEVEL UPON COMPLETION: NONE

CAVE OF BOREHOLE AT



# soil and materials engineers, inc.

PROJECT NAME: OLIVER TOWERS REDEVELOPMENT  
PROJECT LOCATION: LANSING, MICHIGAN  
CLIENT: LANSING BRA

A/E: SOIL BORING SB16  
BY: JPB/BDM START: 10/03/11 END: 10/3/11  
PROJECT NUMBER: 062859.00.005 SHEET: 1

DEPTH (FEET)	SYMBOLIC PROFILE	PROFILE DESCRIPTION	SAMPLE TYPE/NUMBER INTERVAL	INCHES OF RECOVERY	BLOWS PER SIX INCHES	PID (ppm)	ANALYTICAL SAMPLE	STANDARD PENETRATION TEST RESISTANCE (N-values) --	NATURAL DENSITY -- (pcf)	MOISTURE, % --	LEGEND ▽ HAND PENETROMETER TEST ☒ TORVANE SHEAR TEST ☐ UNCONFINED COMPRESSION TEST ✕ VANE SHEAR TEST ✕ REMOLDED VANE SHEAR ✕ TRIAXIAL TEST	SHEAR STRENGTH (KSF)
									90 100 110	0 10 20 30 40		
0		GROUND SURFACE ELEVATION= 845' (+/-)										
0		Three Inches of Asphalt Concrete										
2.5		Sandy Clay- Some Silt- Trace Gravel- Occasional Brick Pieces- Dark Brown (CL/Fill)	LS1									
5		Fine to Medium Sand- Trace to Some Silt- Trace Gravel- Brown- Moist to Wet (SP-SM/Fill)	LS2									
7.5			LS3									
10		Silty Clay- Trace Sand and Gravel- Brown (CL)	LS4									
12.5		END OF BORING AT 12 FEET.	LS5									
15			LS6									
17.5												

WATER LEVEL OBSERVATIONS

GROUNDWATER ENCOUNTERED DURING DRILLING

GROUNDWATER ENCOUNTERED UPON COMPLETION OF DRILLING

Notes:

1. THE INDICATED STRATIFICATION LINES ARE CONSIDERED APPROXIMATE. IN-SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL.
2. NO ODORS NOTED AND NO STAINING OBSERVED.
3. A TEMPORARY MONITORING WELL WAS INSTALLED FROM 3 FEET TO 8 FEET BELOW GRADE, HOWEVER INSUFFICIENT GROUNDWATER ENTERED THE WELL AND NO SAMPLE WAS COLLECTED.
4. SURFACE CAPPED WITH COLD PATCH AFTER BACKFILLING THE BOREHOLE.

DRILLER: BJM  
RIG NO.: 274

DRILL METHOD: DIRECT PUSH  
BACKFILL METHOD: SOIL CUTTINGS

WATER LEVEL DURING DRILLING: 6  
WATER LEVEL UPON COMPLETION: NONE

WATER LEVEL  
CAVE OF BOREHOLE AT  
HOURS AFTER COMPLETION:



# soil and materials engineers, inc.

PROJECT NAME: OLIVER TOWERS REDEVELOPMENT

A/E:

SOIL BORING SB17

PROJECT LOCATION: LANSING, MICHIGAN

BY: JPB/BDM

START: 10/03/11

END: 10/3/11

CLIENT: LANSING BRA

PROJECT NUMBER: 062859.00.005

SHEET: 1

DEPTH (FEET)	SYMBOLIC PROFILE	PROFILE DESCRIPTION	SAMPLE TYPE NUMBER INTERVAL	INCHES OF RECOVERY	BLOWS PER SIX INCHES	PID (ppm)	ANALYTICAL SAMPLE	STANDARD PENETRATION TEST RESISTANCE (N-values) -	NATURAL DENSITY -- (pcf)		MOISTURE, % - ATTERBERG LIMITS		LEGEND		
									90	100	110	0	10	20	30
0		GROUND SURFACE ELEVATION= 847' (+/-)													
0		Six Inches of Sandy Topsoil													
2.5		Fine to Medium Sand- Trace to Some Silt- Trace Gravel- Brown- Moist (SP- SM/FILL)	LS1		0										
5			LS2		0										
7.5		Sandy Clay- Some Silt- Trace Gravel- Brown (CL)	LS3		0										
10			LS4		0										
12.5			LS5		50										
15			LS6		7000										
17.5		Silty Clay- Trace Sand and Gravel- Occasional Sand Seams- Brown (CL)	LS7		3000										
		END OF BORING AT 16 FEET.	LS8		0										

**WATER LEVEL OBSERVATIONS**

GROUNDWATER ENCOUNTERED DURING DRILLING

GROUNDWATER ENCOUNTERED UPON COMPLETION OF DRILLING

**Notes:**

1. THE INDICATED STRATIFICATION LINES ARE CONSIDERED APPROXIMATE. IN-SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL.
2. ODORS NOTED WITHIN THE SAND SEAMS ENCOUNTERED BETWEEN 11 AND 14 FEET BELOW GRADE. NO STAINING OBSERVED.
3. GROUNDWATER WAS NOT ENCOUNTERED.

DRILLER: BJM

DRILL METHOD: DIRECT PUSH

WATER LEVEL DURING DRILLING: NONE

WATER LEVEL

HOURS AFTER COMPLETION:

RIG NO.: 274

BACKFILL METHOD: SOIL CUTTINGS

WATER LEVEL UPON COMPLETION: NONE

CAVE OF BOREHOLE AT





# soil and materials engineers, inc.

PROJECT NAME: OLIVER TOWERS REDEVELOPMENT  
PROJECT LOCATION: LANSING, MICHIGAN  
CLIENT: LANSING BRA

A/E: SOIL BORING SB18  
BY: JPB/BDM START: 10/03/11 END: 10/3/11  
PROJECT NUMBER: 062859.00.005 SHEET: 1

DEPTH (FEET)	SYMBOLIC PROFILE	PROFILE DESCRIPTION	SAMPLE TYPE/NUMBER INTERVAL	INCHES OF RECOVERY	BLOWS PER SIX INCHES	PID (ppm)	ANALYTICAL SAMPLE	STANDARD PENETRATION TEST RESISTANCE (N-values) -	NATURAL DENSITY -- (pcf)	MOISTURE, % -	ATTERBERG	LIMITS	LEGEND				
									90 100 110	0 10 20 30 40	0.0 1.0 2.0 3.0 4.0 5.0		HAND PENETROMETER TEST	TORVANE SHEAR TEST	UNCONFINED COMPRESSION TEST	VANE SHEAR TEST	REMOLDED VANE SHEAR
0		GROUND SURFACE ELEVATION= 848' (+/-)															
0		Three Inches of Asphalt Concrete															
2.5		Clayey Fine Sand- Some Silt- Trace Gravel- Dark Brown- Moist (SC/Fill)	LS1			<1											
5			LS2			<1											
7.5			LS3			<1											
10		Silty Clay- Trace Sand and Gravel- Occasional Silt Seams- Brown (CL)	LS4			<1											
12.5		END OF BORING AT 12 FEET.	LS5			<1											
15			LS6			<1											
17.5																	

**WATER LEVEL OBSERVATIONS**

GROUNDWATER ENCOUNTERED DURING DRILLING

GROUNDWATER ENCOUNTERED UPON COMPLETION OF DRILLING

**Notes:**

1. THE INDICATED STRATIFICATION LINES ARE CONSIDERED APPROXIMATE. IN-SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL.
2. NO ODORS NOTED AND NO STAINING OBSERVED.
3. GROUNDWATER WAS NOT ENCOUNTERED.
4. SURFACE CAPPED WITH COLD PATCH AFTER BACKFILLING THE BOREHOLE.

DRILLER: BJM

DRILL METHOD: DIRECT PUSH

WATER LEVEL DURING DRILLING: NONE

WATER LEVEL

HOURS AFTER COMPLETION:

RIG NO.: 274

BACKFILL METHOD: SOIL CUTTINGS

WATER LEVEL UPON COMPLETION: NONE

CAVE OF BOREHOLE AT



**SHEET: 1**

### CAVE OF BOREHOLE AT



# soil and materials engineers, inc.

PROJECT NAME: OLIVER TOWERS REDEVELOPMENT  
PROJECT LOCATION: LANSING, MICHIGAN  
CLIENT: LANSING BRA

A/E: SOIL BORING SB20  
BY: JPB/BDM START: 10/03/11 END: 10/3/11  
PROJECT NUMBER: 062859.00.005 SHEET: 1

DEPTH (FEET)	SYMBOLIC PROFILE	PROFILE DESCRIPTION	SAMPLE TYPE/NUMBER INTERVAL	INCHES OF RECOVERY	BLOWS PER SIX INCHES	PID (ppm)	ANALYTICAL SAMPLE	STANDARD PENETRATION TEST RESISTANCE (N-values) -	NATURAL DENSITY - (pcf)		MOISTURE, % - ATTERBERG LIMITS		SHEAR STRENGTH (KSF)		LEGEND ▽ HAND PENETROMETER TEST ⊠ TORVANE SHEAR TEST ○ UNCONFINED COMPRESSION TEST ⊞ VANE SHEAR TEST ⊕ REMOLDED VANE SHEAR ⊕ TRIAXIAL TEST
									90	100	110	0	10	20	
0		GROUND SURFACE ELEVATION= 846' (+/-)													
0		Three Inches of Asphalt Concrete													
2.5		Fine to Medium Sand- Trace to Some Silt- Trace Gravel- Occasional Asphalt Pieces- Brick Encountered at 4 Feet- Dark Brown- Moist (SP-SM/Fill)	LS1			<1									
5		Clayey Fine Sand- Some Silt- Trace Gravel- Brown and Dark Brown- Moist (SC/Fill)	LS2			<1									
7.5			LS3			<1									
10			LS4			<1									
12.5		Sandy Fibrous Peat- Frequent Clay Seams- Black (Pt)	LS5			<1									
15			LS6			<1									
17.5		END OF BORING AT 12 FEET.													

**WATER LEVEL OBSERVATIONS**

☞ GROUNDWATER ENCOUNTERED DURING DRILLING

☞ GROUNDWATER ENCOUNTERED  
UPON COMPLETION OF DRILLING

**Notes:** 1. THE INDICATED STRATIFICATION LINES ARE CONSIDERED APPROXIMATE. IN-SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL.

2. NO ODORS NOTED AND NO STAINING OBSERVED.

3. GROUNDWATER WAS NOT ENCOUNTERED.

4. SURFACE CAPPED WITH COLD PATCH AFTER BACKFILLING THE BOREHOLE.

DRILLER: BJM

DRILL METHOD: DIRECT PUSH

WATER LEVEL DURING DRILLING: NONE

WATER LEVEL

HOURS AFTER COMPLETION:

RIG NO.: 274

BACKFILL METHOD: SOIL CUTTINGS

WATER LEVEL UPON COMPLETION: NONE

CAVE OF BOREHOLE AT





# soil and materials engineers, inc.

PROJECT NAME: OLIVER TOWERS REDEVELOPMENT  
PROJECT LOCATION: LANSING, MICHIGAN  
CLIENT: LANSING BRA

A/E: SOIL BORING SB21  
BY: JPB/BDM START: 10/03/11 END: 10/3/11  
PROJECT NUMBER: 062859.00.005 SHEET: 1

DEPTH (FEET)	SYMBOLIC PROFILE	PROFILE DESCRIPTION	SAMPLE TYPE/NUMBER INTERVAL	INCHES OF RECOVERY	BLOWS PER SIX INCHES	PID (ppm)	ANALYTICAL SAMPLE	STANDARD PENETRATION TEST RESISTANCE (N-values) --	NATURAL DENSITY -- (pcf)		MOISTURE, % -- ATTERBERG LIMITS		LEGEND	
									90 100 110	0 10 20 30 40	0.0 1.0 2.0 3.0 4.0 5.0	HAND PENETROMETER TEST TORVANE SHEAR TEST UNCONFINED COMPRESSION TEST VANE SHEAR TEST REMOLDED VANE SHEAR TRIAXIAL TEST		
0		GROUND SURFACE ELEVATION= 847' (+/-)												
		Three Inches of Asphalt Concrete												
		Four Inches of Sandy Fine Gravel- Some Silt- Brown	LS1											
2.5														
		Sandy Clay- Some Silt- Frequent Fine Sand Seams- Brown and Gray- Stiff (CL/Fill)	LS2											
5			LS3											
7.5		Sandy Clay- Frequent Dark Brown Sand Seams and Sandy Peat Layers- Brown (CL)	LS4											
			LS5											
10		Sandy Clay- Some Silt- Frequent Wet Sand Seams- Gray- Stiff to Medium (CL)	LS6											
12.5		END OF BORING AT 12 FEET.												
15														
17.5														

WATER LEVEL OBSERVATIONS

GROUNDWATER ENCOUNTERED DURING DRILLING

GROUNDWATER ENCOUNTERED  
UPON COMPLETION OF DRILLING

Notes:

1. THE INDICATED STRATIFICATION LINES ARE CONSIDERED APPROXIMATE. IN-SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL.
2. NO ODORS NOTED AND NO STAINING OBSERVED.
3. GROUNDWATER WAS NOT ENCOUNTERED.
4. SURFACE CAPPED WITH COLD PATCH AFTER BACKFILLING THE BOREHOLE.

DRILLER: BJM

DRILL METHOD: DIRECT PUSH

WATER LEVEL DURING DRILLING: NONE

WATER LEVEL

HOURS AFTER COMPLETION:

RIG NO.: 274

BACKFILL METHOD: SOIL CUTTINGS

WATER LEVEL UPON COMPLETION: NONE

CAVE OF BOREHOLE AT

**APPENDIX C**  
**LABORATORY DATA REPORTS**



Wednesday, October 12, 2011

Fibertec Project Number: 46662  
Project Identification: Olivet Towers /062859.005  
Submittal Date: 10/04/2011

Mr. J.P. Buckingham  
Soil and Materials Engineers, Inc. - Lansing  
2663 Eaton Rapids Road  
Lansing, MI 48911

Dear Mr. Buckingham,

Thank you for selecting Fibertec Environmental Services as your analytical laboratory. The samples you submitted have been analyzed in accordance with NELAC standards and the results compiled in the attached report. Any exceptions to NELAC compliance are noted in the report. These results apply only to those samples submitted. Please note samples will be disposed of 30 days after reporting date.

If you have any questions regarding these results or if we may be of further assistance to you, please contact me at (517) 699-0345.

Sincerely,



Daryl P. Strandbergh  
Laboratory Director

DPS/kc

Enclosures

1914 Holloway Drive  
11766 E. Grand River  
8660 S. Mackinaw Trail

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T: (810) 220-3300  
T: (231) 775-8368

F: (517) 699-0388  
F: (810) 220-3311  
F: (231) 775-8584

Client Identification:	Soil and Materials Engineers, Inc. - Lansing	Sample Description:	SB9-GW	Chain of Custody:	105664
Client Project Name:	Olivet Towers	Sample No:	1	Collect Date:	10/03/11
Client Project No:	062859.005	Sample Matrix:	Ground Water	Collect Time:	11:40

Sample Comments:

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable NN: Parameter not included in NELAC Scope of Analysis.

Michigan 10 Elements by ICP/MS, Total Recoverable (EPA 3005A-M/EPA 6020A)				Aliquot ID: 46662-001A		Matrix: Ground Water		Analyst: JLH	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Arsenic	12		µg/L	5.0	10	10/10/11	PT11J10F	10/10/11	T211J10A
2. Barium	2400		µg/L	100	10	10/10/11	PT11J10F	10/10/11	T211J10A
3. Cadmium	U		µg/L	1.0	10	10/10/11	PT11J10F	10/10/11	T211J10A
4. Chromium	U		µg/L	10	10	10/10/11	PT11J10F	10/10/11	T211J10A
5. Copper	13		µg/L	4.0	10	10/10/11	PT11J10F	10/10/11	T211J10A
6. Lead	16		µg/L	3.0	10	10/10/11	PT11J10F	10/10/11	T211J10A
7. Selenium	U		µg/L	5.0	10	10/10/11	PT11J10F	10/10/11	T211J10A
8. Silver	U		µg/L	0.20	10	10/10/11	PT11J10F	10/11/11	T211J11A
9. Zinc	69		µg/L	50	10	10/10/11	PT11J10F	10/10/11	T211J10A

Mercury by CVAAS, Total (EPA 7470A)				Aliquot ID: 46662-001A		Matrix: Ground Water		Analyst: JLH	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Mercury	U		µg/L	0.20	1.0	10/11/11	PM11J11B	10/11/11	M411J11A

Volatile Organic Compounds (VOCs) by GC/MS (EPA 5030B/EPA 8260B)				Aliquot ID: 46662-001		Matrix: Ground Water		Analyst: JAS	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Acetone	U		µg/L	50	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
2. Acrylonitrile	U		µg/L	2.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
3. Benzene	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
4. Bromobenzene	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
5. Bromochloromethane	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
6. Bromodichloromethane	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
7. Bromoform	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
8. Bromomethane	U		µg/L	5.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
9. 2-Butanone	U		µg/L	25	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
10. n-Butylbenzene	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
11. sec-Butylbenzene	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
12. tert-Butylbenzene	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
13. Carbon Disulfide	U		µg/L	5.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
14. Carbon Tetrachloride	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
15. Chlorobenzene	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
16. Chloroethane	U		µg/L	5.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
17. Chloroform	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
18. Chloromethane	U		µg/L	5.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
19. 2-Chlorotoluene	U		µg/L	5.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
20. Dibromochloromethane	U		µg/L	5.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
21. 1,2-Dibromo-3-chloropropane (NN)	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A

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Client Identification:	<b>Soil and Materials Engineers, Inc. - Lansing</b>	Sample Description:	<b>SB9-GW</b>	Chain of Custody:	<b>105664</b>
Client Project Name:	<b>Olivet Towers</b>	Sample No:	<b>1</b>	Collect Date:	<b>10/03/11</b>
Client Project No:	<b>062859.005</b>	Sample Matrix:	<b>Ground Water</b>	Collect Time:	<b>11:40</b>

Sample Comments:

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable NN: Parameter not included in NELAC Scope of Analysis.

Volatile Organic Compounds (VOCs) by GC/MS (EPA 5030B/EPA 8260B)				Aliquot ID: 46662-001		Matrix: Ground Water		Analyst: JAS	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
22 Dibromomethane	U		µg/L	5.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
23 1,2-Dichlorobenzene	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
24 1,3-Dichlorobenzene	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
25 1,4-Dichlorobenzene	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
26 Dichlorodifluoromethane	U		µg/L	5.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
27 1,1-Dichloroethane	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
28 1,2-Dichloroethane	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
29 1,1-Dichloroethene	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
30 cis-1,2-Dichloroethene	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
31 trans-1,2-Dichloroethene	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
32 1,2-Dichloropropane	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
33 cis-1,3-Dichloropropene	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
34 trans-1,3-Dichloropropene	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
35 Ethylbenzene	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
36 Ethylene Dibromide	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
37 2-Hexanone	U		µg/L	50	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
38 Isopropylbenzene	U		µg/L	5.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
39 Methyl Iodide	U		µg/L	5.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
40 Methylene Chloride	U		µg/L	5.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
41 4-Methyl-2-pentanone	U		µg/L	50	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
42 MTBE	U		µg/L	5.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
43 Naphthalene	U		µg/L	5.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
44 n-Propylbenzene	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
45 Styrene	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
46 1,1,1,2-Tetrachloroethane	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
47 1,1,1,2,2-Tetrachloroethane	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
48 Tetrachloroethene	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
49 Toluene	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
50 1,2,4-Trichlorobenzene	U		µg/L	5.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
51 1,1,1-Trichloroethane	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
52 1,1,2-Trichloroethane	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
53 Trichloroethene	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
54 Trichlorofluoromethane	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
55 1,2,3-Trichloropropane	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
56 1,2,3-Trimethylbenzene (NN)	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
57 1,2,4-Trimethylbenzene	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
58 1,3,5-Trimethylbenzene	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
59 Vinyl Chloride	U		µg/L	1.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A
60 Xylenes	U		µg/L	3.0	1.0	10/11/11	VB11J11A	10/11/11	VB11J11A

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Client Identification: <b>Soil and Materials Engineers, Inc. - Lansing</b>	Sample Description: <b>SB9-GW</b>	Chain of Custody: <b>105664</b>
Client Project Name: <b>Olivet Towers</b>	Sample No: <b>1</b>	Collect Date: <b>10/03/11</b>
Client Project No: <b>062859.005</b>	Sample Matrix: <b>Ground Water</b>	Collect Time: <b>11:40</b>

Sample Comments:

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable NN: Parameter not included in NELAC Scope of Analysis.

Polynuclear Aromatic Hydrocarbons (PNAs) (EPA 3535A/EPA 8270C)				Aliquot ID: 46662-001B		Matrix: Ground Water		Analyst: TMC	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Acenaphthene	U		µg/L	5.0	1.1	10/10/11	PS11J10D	10/10/11	S311J10A
2. Acenaphthylene	U		µg/L	5.0	1.1	10/10/11	PS11J10D	10/10/11	S311J10A
3. Anthracene	U		µg/L	5.0	1.1	10/10/11	PS11J10D	10/10/11	S311J10A
4. Benzo(a)anthracene	U		µg/L	1.1	1.1	10/10/11	PS11J10D	10/10/11	S311J10A
5. Benzo(a)pyrene	U		µg/L	1.1	1.1	10/10/11	PS11J10D	10/10/11	S311J10A
6. Benzo(b)fluoranthene	U		µg/L	1.1	1.1	10/10/11	PS11J10D	10/10/11	S311J10A
7. Benzo(ghi)perylene	U		µg/L	1.1	1.1	10/10/11	PS11J10D	10/10/11	S311J10A
8. Benzo(k)fluoranthene	U		µg/L	1.1	1.1	10/10/11	PS11J10D	10/10/11	S311J10A
9. Chrysene	U		µg/L	1.1	1.1	10/10/11	PS11J10D	10/10/11	S311J10A
10. Dibenzo(a,h)anthracene	U		µg/L	2.0	1.1	10/10/11	PS11J10D	10/10/11	S311J10A
11. Fluoranthene	U		µg/L	1.1	1.1	10/10/11	PS11J10D	10/10/11	S311J10A
12. Fluorene	U		µg/L	5.0	1.1	10/10/11	PS11J10D	10/10/11	S311J10A
13. Indeno(1,2,3-cd)pyrene	U		µg/L	2.0	1.1	10/10/11	PS11J10D	10/10/11	S311J10A
14. 2-Methylnaphthalene	U		µg/L	5.0	1.1	10/10/11	PS11J10D	10/10/11	S311J10A
15. Phenanthrene	U		µg/L	2.0	1.1	10/10/11	PS11J10D	10/10/11	S311J10A
16. Pyrene	U		µg/L	5.0	1.1	10/10/11	PS11J10D	10/10/11	S311J10A

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Client Identification:	Soil and Materials Engineers, Inc. - Lansing	Sample Description:	SB13-S1	Chain of Custody:	105664
Client Project Name:	Olivet Towers	Sample No:	2	Collect Date:	10/03/11
Client Project No:	062859.005	Sample Matrix:	Soil/Solid	Collect Time:	12:45
Sample Comments:	Soil results have been calculated and reported on a dry weight basis unless otherwise noted.				
Definitions:	Q: Qualifier (see definitions at end of report) NA: Not Applicable NN: Parameter not included in NELAC Scope of Analysis.				

Dry Weight Determination (ASTM D 2974-87)				Aliquot ID: 46662-002		Matrix: Soil/Solid		Analyst: BMG	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Percent Moisture (Water Content) (NN)	9.1		%	0.1	1.0	10/05/11	MC111005	10/06/11	MC111005

Michigan 10 Elements by ICP/MS (EPA 0200.2-M/EPA 6020A)				Aliquot ID: 46662-002		Matrix: Soil/Solid		Analyst: JLH	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Arsenic	3000		µg/kg	100	20	10/10/11	PT11J10D	10/10/11	T211J10A
2. Barium	18000		µg/kg	1000	20	10/10/11	PT11J10D	10/10/11	T211J10A
3. Cadmium	120		µg/kg	50	20	10/10/11	PT11J10D	10/10/11	T211J10A
4. Chromium	4200		µg/kg	500	20	10/10/11	PT11J10D	10/10/11	T211J10A
5. Copper	7500		µg/kg	1000	20	10/10/11	PT11J10D	10/10/11	T211J10A
6. Lead	24000		µg/kg	1000	20	10/10/11	PT11J10D	10/10/11	T211J10A
7. Selenium	210		µg/kg	200	20	10/10/11	PT11J10D	10/10/11	T211J10A
8. Silver	U		µg/kg	100	20	10/10/11	PT11J10D	10/10/11	T211J10A
9. Zinc	24000		µg/kg	1000	20	10/10/11	PT11J10D	10/10/11	T211J10A

Mercury by CVAAS (EPA 7471B)				Aliquot ID: 46662-002		Matrix: Soil/Solid		Analyst: MAP	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Mercury	U		µg/kg	50	10	10/07/11	PM11J07B	10/11/11	M411J11A

Polychlorinated Biphenyls (PCBs) (EPA 3546/EPA 8082A)				Aliquot ID: 46662-002		Matrix: Soil/Solid		Analyst: BDA	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Aroclor-1016	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
2. Aroclor-1221	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
3. Aroclor-1232	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
4. Aroclor-1242	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
5. Aroclor-1248	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
6. Aroclor-1254	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
7. Aroclor-1260	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
8. Aroclor-1262 (NN)	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
9. Aroclor-1268 (NN)	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A

Polynuclear Aromatic Hydrocarbons (PNAs) (EPA 3546/EPA 8270C)				Aliquot ID: 46662-002		Matrix: Soil/Solid		Analyst: HLS	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Acenaphthene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
2. Acenaphthylene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
3. Anthracene (SIM)	U	J,L-	µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
4. Benzo(a)anthracene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A

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Client Identification:	<b>Soil and Materials Engineers, Inc. - Lansing</b>	Sample Description:	<b>SB13-S1</b>	Chain of Custody:	<b>105664</b>
Client Project Name:	<b>Olivet Towers</b>	Sample No:	<b>2</b>	Collect Date:	<b>10/03/11</b>
Client Project No:	<b>062859.005</b>	Sample Matrix:	<b>Soil/Solid</b>	Collect Time:	<b>12:45</b>

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable NN: Parameter not included in NELAC Scope of Analysis.

Polynuclear Aromatic Hydrocarbons (PNAs) (EPA 3546/EPA 8270C)				Aliquot ID: 46662-002		Matrix: Soil/Solid		Analyst: HLS	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
5. Benzo(a)pyrene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
6. Benzo(b)fluoranthene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
7. Benzo(ghi)perylene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
8. Benzo(k)fluoranthene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
9. Chrysene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
10. Dibenzo(a,h)anthracene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
11. Fluoranthene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
12. Fluorene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
13. Indeno(1,2,3-cd)pyrene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
14. 2-Methylnaphthalene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
15. Naphthalene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
16. Phenanthrene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
17. Pyrene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A

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Client Identification:	Soil and Materials Engineers, Inc. - Lansing	Sample Description:	SB14-S2	Chain of Custody:	105664
Client Project Name:	Olivet Towers	Sample No:	3	Collect Date:	10/03/11
Client Project No:	062859.005	Sample Matrix:	Soil/Solid	Collect Time:	13:10
Sample Comments:	Soil results have been calculated and reported on a dry weight basis unless otherwise noted.				
Definitions:	Q: Qualifier (see definitions at end of report) NA: Not Applicable NN: Parameter not included in NELAC Scope of Analysis.				

Dry Weight Determination (ASTM D 2974-87)				Aliquot ID: 46662-003A		Matrix: Soil/Solid		Analyst: BMG	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Percent Moisture (Water Content) (NN)	12		%	0.1	1.0	10/05/11	MC111005	10/06/11	MC111005

Michigan 10 Elements by ICP/MS (EPA 0200.2-M/EPA 6020A)				Aliquot ID: 46662-003A		Matrix: Soil/Solid		Analyst: JLH	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Arsenic	6000		µg/kg	100	20	10/10/11	PT11J10D	10/10/11	T211J10A
2. Barium	58000		µg/kg	1000	20	10/10/11	PT11J10D	10/10/11	T211J10A
3. Cadmium	380		µg/kg	50	20	10/10/11	PT11J10D	10/10/11	T211J10A
4. Chromium	8500		µg/kg	500	20	10/10/11	PT11J10D	10/10/11	T211J10A
5. Copper	31000		µg/kg	1000	20	10/10/11	PT11J10D	10/10/11	T211J10A
6. Lead	93000		µg/kg	1000	20	10/10/11	PT11J10D	10/10/11	T211J10A
7. Selenium	350		µg/kg	200	20	10/10/11	PT11J10D	10/10/11	T211J10A
8. Silver	140		µg/kg	100	20	10/10/11	PT11J10D	10/10/11	T211J10A
9. Zinc	83000		µg/kg	1000	20	10/10/11	PT11J10D	10/10/11	T211J10A

Mercury by CVAAS (EPA 7471B)				Aliquot ID: 46662-003A		Matrix: Soil/Solid		Analyst: MAP	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Mercury	730		µg/kg	50	10	10/07/11	PM11J07B	10/11/11	M411J11A

Polychlorinated Biphenyls (PCBs) (EPA 3546/EPA 8082A)				Aliquot ID: 46662-003A		Matrix: Soil/Solid		Analyst: BDA	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Aroclor-1016	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
2. Aroclor-1221	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
3. Aroclor-1232	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
4. Aroclor-1242	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
5. Aroclor-1248	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
6. Aroclor-1254	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
7. Aroclor-1260	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
8. Aroclor-1262 (NN)	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
9. Aroclor-1268 (NN)	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A

Polynuclear Aromatic Hydrocarbons (PNAs) (EPA 3546/EPA 8270C)				Aliquot ID: 46662-003A		Matrix: Soil/Solid		Analyst: HLS	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Acenaphthene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
2. Acenaphthylene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
3. Anthracene (SIM)	U	J,L-	µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
4. Benzo(a)anthracene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A

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Client Identification:	<b>Soil and Materials Engineers, Inc. - Lansing</b>	Sample Description:	<b>SB14-S2</b>	Chain of Custody:	<b>105664</b>
Client Project Name:	<b>Olivet Towers</b>	Sample No:	<b>3</b>	Collect Date:	<b>10/03/11</b>
Client Project No:	<b>062859.005</b>	Sample Matrix:	<b>Soil/Solid</b>	Collect Time:	<b>13:10</b>
Sample Comments:	<b>Soil results have been calculated and reported on a dry weight basis unless otherwise noted.</b>				
Definitions:	Q: Qualifier (see definitions at end of report) NA: Not Applicable NN: Parameter not included in NELAC Scope of Analysis.				

Polynuclear Aromatic Hydrocarbons (PNAs) (EPA 3546/EPA 8270C)				Aliquot ID: 46662-003A		Matrix: Soil/Solid		Analyst: HLS	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
5. Benzo(a)pyrene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
6. Benzo(b)fluoranthene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
7. Benzo(ghi)perylene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
8. Benzo(k)fluoranthene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
9. Chrysene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
10. Dibenzo(a,h)anthracene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
11. Fluoranthene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
12. Fluorene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
13. Indeno(1,2,3-cd)pyrene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
14. 2-Methylnaphthalene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
15. Naphthalene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
16. Phenanthrene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
17. Pyrene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A

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Client Identification:	Soil and Materials Engineers, Inc. - Lansing	Sample Description:	SB16-S1	Chain of Custody:	105664
Client Project Name:	Olivet Towers	Sample No:	4	Collect Date:	10/03/11
Client Project No:	062859.005	Sample Matrix:	Soil/Solid	Collect Time:	13:30
Sample Comments:	Soil results have been calculated and reported on a dry weight basis unless otherwise noted.				
Definitions:	Q: Qualifier (see definitions at end of report) NA: Not Applicable NN: Parameter not included in NELAC Scope of Analysis.				

Dry Weight Determination (ASTM D 2974-87)				Aliquot ID: 46662-004A		Matrix: Soil/Solid		Analyst: BMG	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Percent Moisture (Water Content) (NN)	12		%	0.1	1.0	10/05/11	MC111005	10/06/11	MC111005

Michigan 10 Elements by ICP/MS (EPA 0200.2-M/EPA 6020A)				Aliquot ID: 46662-004A		Matrix: Soil/Solid		Analyst: JLH	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Arsenic	2200		µg/kg	100	20	10/10/11	PT11J10D	10/10/11	T211J10A
2. Barium	36000		µg/kg	1000	20	10/10/11	PT11J10D	10/10/11	T211J10A
3. Cadmium	110		µg/kg	50	20	10/10/11	PT11J10D	10/10/11	T211J10A
4. Chromium	9400		µg/kg	500	20	10/10/11	PT11J10D	10/10/11	T211J10A
5. Copper	15000		µg/kg	1000	20	10/10/11	PT11J10D	10/10/11	T211J10A
6. Lead	46000		µg/kg	1000	20	10/10/11	PT11J10D	10/10/11	T211J10A
7. Selenium	U		µg/kg	200	20	10/10/11	PT11J10D	10/10/11	T211J10A
8. Silver	U		µg/kg	100	20	10/10/11	PT11J10D	10/10/11	T211J10A
9. Zinc	33000		µg/kg	1000	20	10/10/11	PT11J10D	10/10/11	T211J10A

Mercury by CVAAS (EPA 7471B)				Aliquot ID: 46662-004A		Matrix: Soil/Solid		Analyst: MAP	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Mercury	U		µg/kg	50	10	10/07/11	PM11J07B	10/11/11	M411J11A

Polychlorinated Biphenyls (PCBs) (EPA 3546/EPA 8082A)				Aliquot ID: 46662-004A		Matrix: Soil/Solid		Analyst: BDA	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Aroclor-1016	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
2. Aroclor-1221	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
3. Aroclor-1232	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
4. Aroclor-1242	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
5. Aroclor-1248	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
6. Aroclor-1254	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
7. Aroclor-1260	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
8. Aroclor-1262 (NN)	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
9. Aroclor-1268 (NN)	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A

Polynuclear Aromatic Hydrocarbons (PNAs) (EPA 3546/EPA 8270C)				Aliquot ID: 46662-004A		Matrix: Soil/Solid		Analyst: HLS	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Acenaphthene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
2. Acenaphthylene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
3. Anthracene (SIM)	U	J,L-	µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
4. Benzo(a)anthracene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A

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Client Identification:	<b>Soil and Materials Engineers, Inc. - Lansing</b>	Sample Description:	<b>SB16-S1</b>	Chain of Custody:	<b>105664</b>
Client Project Name:	<b>Olivet Towers</b>	Sample No:	<b>4</b>	Collect Date:	<b>10/03/11</b>
Client Project No:	<b>062859.005</b>	Sample Matrix:	<b>Soil/Solid</b>	Collect Time:	<b>13:30</b>

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable NN: Parameter not included in NELAC Scope of Analysis.

Polynuclear Aromatic Hydrocarbons (PNAs) (EPA 3546/EPA 8270C)				Aliquot ID: 46662-004A		Matrix: Soil/Solid		Analyst: HLS	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
5. Benzo(a)pyrene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
6. Benzo(b)fluoranthene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
7. Benzo(ghi)perylene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
8. Benzo(k)fluoranthene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
9. Chrysene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
10. Dibenzo(a,h)anthracene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
11. Fluoranthene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
12. Fluorene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
13. Indeno(1,2,3-cd)pyrene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
14. 2-Methylnaphthalene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
15. Naphthalene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
16. Phenanthrene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A
17. Pyrene (SIM)	U		µg/kg	330	20	10/10/11	PS11J10A	10/10/11	S611J10A

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Client Identification: <b>Soil and Materials Engineers, Inc. - Lansing</b>	Sample Description: <b>SB19-S5</b>	Chain of Custody: <b>105664</b>
Client Project Name: <b>Olivet Towers</b>	Sample No: <b>5</b>	Collect Date: <b>10/03/11</b>
Client Project No: <b>062859.005</b>	Sample Matrix: <b>Soil/Solid</b>	Collect Time: <b>14:10</b>

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable NN: Parameter not included in NELAC Scope of Analysis.

Dry Weight Determination (ASTM D 2974-87)				Aliquot ID: 46662-005A		Matrix: Soil/Solid		Analyst: BMG	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Percent Moisture (Water Content) (NN)	16		%	0.1	1.0	10/05/11	MC111005	10/06/11	MC111005

Trace Elements by ICP/MS (EPA 0200.2-M/EPA 6020A)				Aliquot ID: 46662-005A		Matrix: Soil/Solid		Analyst: JLH	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Lead	8400		µg/kg	1000	20	10/10/11	PT11J10D	10/10/11	T211J10A

Volatile Organic Compounds (VOCs) by GC/MS, 5035 (EPA 5035/EPA 8260B)				Aliquot ID: 46662-005		Matrix: Soil/Solid		Analyst: JAS	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Acetone	U		µg/kg	1000	1.0	10/05/11	V911J05A	10/05/11	V911J05A
2. Acrylonitrile	U		µg/kg	120	1.0	10/05/11	V911J05A	10/05/11	V911J05A
3. Benzene	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
4. Bromobenzene	U		µg/kg	100	1.0	10/05/11	V911J05A	10/05/11	V911J05A
5. Bromochloromethane	U		µg/kg	120	1.0	10/05/11	V911J05A	10/05/11	V911J05A
6. Bromodichloromethane	U		µg/kg	100	1.0	10/05/11	V911J05A	10/05/11	V911J05A
7. Bromoform	U		µg/kg	100	1.0	10/05/11	V911J05A	10/05/11	V911J05A
8. Bromomethane	U		µg/kg	200	1.0	10/05/11	V911J05A	10/05/11	V911J05A
9. 2-Butanone	U		µg/kg	750	1.0	10/05/11	V911J05A	10/05/11	V911J05A
10. n-Butylbenzene	6000		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
11. sec-Butylbenzene	1200		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
12. tert-Butylbenzene	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
13. Carbon Disulfide	U		µg/kg	250	1.0	10/05/11	V911J05A	10/05/11	V911J05A
14. Carbon Tetrachloride	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
15. Chlorobenzene	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
16. Chloroethane	U		µg/kg	250	1.0	10/05/11	V911J05A	10/05/11	V911J05A
17. Chloroform	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
18. Chloromethane	U		µg/kg	250	1.0	10/05/11	V911J05A	10/05/11	V911J05A
19. 2-Chlorotoluene	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
20. Dibromochloromethane	U		µg/kg	120	1.0	10/05/11	V911J05A	10/05/11	V911J05A
21. 1,2-Dibromo-3-chloropropane (NN)	U		µg/kg	10	1.0	10/05/11	V911J05A	10/05/11	V911J05A
22. Dibromomethane	U		µg/kg	250	1.0	10/05/11	V911J05A	10/05/11	V911J05A
23. 1,2-Dichlorobenzene	U		µg/kg	100	1.0	10/05/11	V911J05A	10/05/11	V911J05A
24. 1,3-Dichlorobenzene	U		µg/kg	100	1.0	10/05/11	V911J05A	10/05/11	V911J05A
25. 1,4-Dichlorobenzene	U		µg/kg	100	1.0	10/05/11	V911J05A	10/05/11	V911J05A
26. Dichlorodifluoromethane	U		µg/kg	250	1.0	10/05/11	V911J05A	10/05/11	V911J05A
27. 1,1-Dichloroethane	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
28. 1,2-Dichloroethane	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
29. 1,1-Dichloroethene	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A

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Client Identification:	Soil and Materials Engineers, Inc. - Lansing	Sample Description:	SB19-S5	Chain of Custody:	105664
Client Project Name:	Olivet Towers	Sample No:	5	Collect Date:	10/03/11
Client Project No:	062859.005	Sample Matrix:	Soil/Solid	Collect Time:	14:10
Sample Comments:	Soil results have been calculated and reported on a dry weight basis unless otherwise noted.				
Definitions:	Q: Qualifier (see definitions at end of report) NA: Not Applicable NN: Parameter not included in NELAC Scope of Analysis.				

Volatile Organic Compounds (VOCs) by GC/MS, 5035 (EPA 5035/EPA 8260B)				Aliquot ID: 46662-005		Matrix: Soil/Solid		Analyst: JAS	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
30. cis-1,2-Dichloroethene	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
31. trans-1,2-Dichloroethene	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
32. 1,2-Dichloropropane	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
33. cis-1,3-Dichloropropene	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
34. trans-1,3-Dichloropropene	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
35. Ethylbenzene	340		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
36. Ethylene Dibromide	U		µg/kg	20	1.0	10/05/11	V911J05A	10/05/11	V911J05A
37. 2-Hexanone	U		µg/kg	2500	1.0	10/05/11	V911J05A	10/05/11	V911J05A
38. Isopropylbenzene	330		µg/kg	250	1.0	10/05/11	V911J05A	10/05/11	V911J05A
39. Methyl Iodide	U		µg/kg	100	1.0	10/05/11	V911J05A	10/05/11	V911J05A
40. Methylene Chloride	U		µg/kg	100	1.0	10/05/11	V911J05A	10/05/11	V911J05A
41. 4-Methyl-2-pentanone	U		µg/kg	2500	1.0	10/05/11	V911J05A	10/05/11	V911J05A
42. MTBE	U		µg/kg	250	1.0	10/05/11	V911J05A	10/05/11	V911J05A
43. Naphthalene	U		µg/kg	1200	1.0	10/05/11	V911J05A	10/05/11	V911J05A
44. n-Propylbenzene	2300		µg/kg	100	1.0	10/05/11	V911J05A	10/05/11	V911J05A
45. Styrene	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
46. 1,1,1,2-Tetrachloroethane	U		µg/kg	120	1.0	10/05/11	V911J05A	10/05/11	V911J05A
47. 1,1,1,2,2-Tetrachloroethane	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
48. Tetrachloroethene	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
49. Toluene	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
50. 1,2,4-Trichlorobenzene	U		µg/kg	330	1.0	10/05/11	V911J05A	10/05/11	V911J05A
51. 1,1,1-Trichloroethane	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
52. 1,1,2-Trichloroethane	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
53. Trichloroethene	U		µg/kg	60	1.0	10/05/11	V911J05A	10/05/11	V911J05A
54. Trichlorofluoromethane	U		µg/kg	100	1.0	10/05/11	V911J05A	10/05/11	V911J05A
55. 1,2,3-Trichloropropane	U		µg/kg	100	1.0	10/05/11	V911J05A	10/05/11	V911J05A
56. 1,2,3-Trimethylbenzene (NN)	17000		µg/kg	120	10	10/05/11	V911J05A	10/05/11	V911J05A
57. 1,2,4-Trimethylbenzene	46000		µg/kg	120	10	10/05/11	V911J05A	10/05/11	V911J05A
58. 1,3,5-Trimethylbenzene	1100		µg/kg	100	1.0	10/05/11	V911J05A	10/05/11	V911J05A
59. Vinyl Chloride	U		µg/kg	40	1.0	10/05/11	V911J05A	10/05/11	V911J05A
60. Xylenes	560		µg/kg	150	1.0	10/05/11	V911J05A	10/05/11	V911J05A

Polynuclear Aromatic Hydrocarbons (PNAs) (EPA 3546/EPA 8270C)				Aliquot ID: 46662-005A		Matrix: Soil/Solid		Analyst: BDA	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Acenaphthene (SIM)	U		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
2. Acenaphthylene (SIM)	U		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
3. Anthracene (SIM)	U		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
4. Benzo(a)anthracene (SIM)	U		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A

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Client Identification:	<b>Soil and Materials Engineers, Inc. - Lansing</b>	Sample Description:	<b>SB19-S5</b>	Chain of Custody:	<b>105664</b>
Client Project Name:	<b>Olivet Towers</b>	Sample No:	<b>5</b>	Collect Date:	<b>10/03/11</b>
Client Project No:	<b>062859.005</b>	Sample Matrix:	<b>Soil/Solid</b>	Collect Time:	<b>14:10</b>

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable NN: Parameter not included in NELAC Scope of Analysis.

Polynuclear Aromatic Hydrocarbons (PNAs) (EPA 3546/EPA 8270C)				Aliquot ID: 46662-005A		Matrix: Soil/Solid		Analyst: BDA	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
5. Benzo(a)pyrene (SIM)	U		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
6. Benzo(b)fluoranthene (SIM)	U		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
7. Benzo(ghi)perylene (SIM)	U		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
8. Benzo(k)fluoranthene (SIM)	U		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
9. Chrysene (SIM)	U		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
10. Dibenzo(a,h)anthracene (SIM)	U		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
11. Fluoranthene (SIM)	U		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
12. Fluorene (SIM)	U		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
13. Indeno(1,2,3-cd)pyrene (SIM)	U		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
14. 2-Methylnaphthalene (SIM)	3000		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
15. Phenanthrene (SIM)	U		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
16. Pyrene (SIM)	U		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A

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Client Identification:	<b>Soil and Materials Engineers, Inc. - Lansing</b>	Sample Description:	<b>SB17-S6</b>	Chain of Custody:	<b>105664</b>
Client Project Name:	<b>Olivet Towers</b>	Sample No:	<b>6</b>	Collect Date:	<b>10/03/11</b>
Client Project No:	<b>062859.005</b>	Sample Matrix:	<b>Soil/Solid</b>	Collect Time:	<b>14:30</b>
Sample Comments:	<b>Soil results have been calculated and reported on a dry weight basis unless otherwise noted.</b>				
Definitions:	Q: Qualifier (see definitions at end of report) NA: Not Applicable NN: Parameter not included in NELAC Scope of Analysis.				

Dry Weight Determination (ASTM D 2974-87)				Aliquot ID: 46662-006A		Matrix: Soil/Solid		Analyst: BMG	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Percent Moisture (Water Content) (NN)	12		%	0.1	1.0	10/05/11	MC111005	10/06/11	MC111005

Trace Elements by ICP/MS (EPA 0200.2-M/EPA 6020A)				Aliquot ID: 46662-006A		Matrix: Soil/Solid		Analyst: JLH	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Lead	8200		µg/kg	1000	20	10/10/11	PT11J10D	10/10/11	T211J10A

Volatile Organic Compounds (VOCs) by GC/MS, 5035 (EPA 5035/EPA 8260B)				Aliquot ID: 46662-006		Matrix: Soil/Solid		Analyst: JAS	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Acetone	U		µg/kg	1000	1.0	10/05/11	V911J05A	10/05/11	V911J05A
2. Acrylonitrile	U		µg/kg	110	1.0	10/05/11	V911J05A	10/05/11	V911J05A
3. Benzene	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
4. Bromobenzene	U		µg/kg	100	1.0	10/05/11	V911J05A	10/05/11	V911J05A
5. Bromochloromethane	U		µg/kg	110	1.0	10/05/11	V911J05A	10/05/11	V911J05A
6. Bromodichloromethane	U		µg/kg	100	1.0	10/05/11	V911J05A	10/05/11	V911J05A
7. Bromoform	U		µg/kg	100	1.0	10/05/11	V911J05A	10/05/11	V911J05A
8. Bromomethane	U		µg/kg	200	1.0	10/05/11	V911J05A	10/05/11	V911J05A
9. 2-Butanone	U		µg/kg	750	1.0	10/05/11	V911J05A	10/05/11	V911J05A
10. n-Butylbenzene	11000		µg/kg	230	20	10/05/11	V911J05A	10/05/11	V911J05A
11. sec-Butylbenzene	2400		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
12. tert-Butylbenzene	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
13. Carbon Disulfide	U		µg/kg	250	1.0	10/05/11	V911J05A	10/05/11	V911J05A
14. Carbon Tetrachloride	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
15. Chlorobenzene	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
16. Chloroethane	U		µg/kg	250	1.0	10/05/11	V911J05A	10/05/11	V911J05A
17. Chloroform	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
18. Chloromethane	U		µg/kg	250	1.0	10/05/11	V911J05A	10/05/11	V911J05A
19. 2-Chlorotoluene	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
20. Dibromochloromethane	U		µg/kg	110	1.0	10/05/11	V911J05A	10/05/11	V911J05A
21. 1,2-Dibromo-3-chloropropane (NN)	U		µg/kg	10	1.0	10/05/11	V911J05A	10/05/11	V911J05A
22. Dibromomethane	U		µg/kg	250	1.0	10/05/11	V911J05A	10/05/11	V911J05A
23. 1,2-Dichlorobenzene	U		µg/kg	100	1.0	10/05/11	V911J05A	10/05/11	V911J05A
24. 1,3-Dichlorobenzene	U		µg/kg	100	1.0	10/05/11	V911J05A	10/05/11	V911J05A
25. 1,4-Dichlorobenzene	U		µg/kg	100	1.0	10/05/11	V911J05A	10/05/11	V911J05A
26. Dichlorodifluoromethane	U		µg/kg	250	1.0	10/05/11	V911J05A	10/05/11	V911J05A
27. 1,1-Dichloroethane	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
28. 1,2-Dichloroethane	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
29. 1,1-Dichloroethene	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A

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Client Identification:	<b>Soil and Materials Engineers, Inc. - Lansing</b>	Sample Description:	<b>SB17-S6</b>	Chain of Custody:	<b>105664</b>
Client Project Name:	<b>Olivet Towers</b>	Sample No:	<b>6</b>	Collect Date:	<b>10/03/11</b>
Client Project No:	<b>062859.005</b>	Sample Matrix:	<b>Soil/Solid</b>	Collect Time:	<b>14:30</b>
Sample Comments:	<b>Soil results have been calculated and reported on a dry weight basis unless otherwise noted.</b>				
Definitions:	Q: Qualifier (see definitions at end of report) NA: Not Applicable NN: Parameter not included in NELAC Scope of Analysis				

Volatile Organic Compounds (VOCs) by GC/MS, 5035 (EPA 5035/EPA 8260B)				Aliquot ID: 46662-006		Matrix: Soil/Solid		Analyst: JAS	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
30. cis-1,2-Dichloroethene	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
31. trans-1,2-Dichloroethene	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
32. 1,2-Dichloropropane	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
33. cis-1,3-Dichloropropene	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
34. trans-1,3-Dichloropropene	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
35. Ethylbenzene	19000		µg/kg	230	20	10/05/11	V911J05A	10/05/11	V911J05A
36. Ethylene Dibromide	U		µg/kg	20	1.0	10/05/11	V911J05A	10/05/11	V911J05A
37. 2-Hexanone	U		µg/kg	2500	1.0	10/05/11	V911J05A	10/05/11	V911J05A
38. Isopropylbenzene	4300		µg/kg	250	1.0	10/05/11	V911J05A	10/05/11	V911J05A
39. Methyl Iodide	U		µg/kg	100	1.0	10/05/11	V911J05A	10/05/11	V911J05A
40. Methylene Chloride	U		µg/kg	100	1.0	10/05/11	V911J05A	10/05/11	V911J05A
41. 4-Methyl-2-pentanone	U		µg/kg	2500	1.0	10/05/11	V911J05A	10/05/11	V911J05A
42. MTBE	U		µg/kg	250	1.0	10/05/11	V911J05A	10/05/11	V911J05A
43. Naphthalene	29000		µg/kg	570	20	10/05/11	V911J05A	10/05/11	V911J05A
44. n-Propylbenzene	18000		µg/kg	230	20	10/05/11	V911J05A	10/05/11	V911J05A
45. Styrene	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
46. 1,1,1,2-Tetrachloroethane	U		µg/kg	110	1.0	10/05/11	V911J05A	10/05/11	V911J05A
47. 1,1,2,2-Tetrachloroethane	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
48. Tetrachloroethene	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
49. Toluene	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
50. 1,2,4-Trichlorobenzene	U		µg/kg	330	1.0	10/05/11	V911J05A	10/05/11	V911J05A
51. 1,1,1-Trichloroethane	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
52. 1,1,2-Trichloroethane	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
53. Trichloroethene	U		µg/kg	57	1.0	10/05/11	V911J05A	10/05/11	V911J05A
54. Trichlorofluoromethane	U		µg/kg	100	1.0	10/05/11	V911J05A	10/05/11	V911J05A
55. 1,2,3-Trichloropropane	U		µg/kg	100	1.0	10/05/11	V911J05A	10/05/11	V911J05A
56. 1,2,3-Trimethylbenzene (NN)	27000		µg/kg	230	20	10/05/11	V911J05A	10/05/11	V911J05A
57. 1,2,4-Trimethylbenzene	110000		µg/kg	230	20	10/05/11	V911J05A	10/05/11	V911J05A
58. 1,3,5-Trimethylbenzene	35000		µg/kg	230	20	10/05/11	V911J05A	10/05/11	V911J05A
59. Vinyl Chloride	U		µg/kg	40	1.0	10/05/11	V911J05A	10/05/11	V911J05A
60. Xylenes	43000		µg/kg	680	20	10/05/11	V911J05A	10/05/11	V911J05A

Polynuclear Aromatic Hydrocarbons (PNAs) (EPA 3546/EPA 8270C)				Aliquot ID: 46662-006A		Matrix: Soil/Solid		Analyst: BDA	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Acenaphthene (SIM)	U		µg/kg	330	20	10/07/11	PS11J07E	10/10/11	S511J10A
2. Acenaphthylene (SIM)	U		µg/kg	330	20	10/07/11	PS11J07E	10/10/11	S511J10A
3. Anthracene (SIM)	U		µg/kg	330	20	10/07/11	PS11J07E	10/10/11	S511J10A
4. Benzo(a)anthracene (SIM)	U		µg/kg	330	20	10/07/11	PS11J07E	10/10/11	S511J10A

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Client Identification:	Soil and Materials Engineers, Inc. - Lansing	Sample Description:	SB17-S6	Chain of Custody:	105664
Client Project Name:	Olivet Towers	Sample No:	6	Collect Date:	10/03/11
Client Project No:	062859.005	Sample Matrix:	Soil/Solid	Collect Time:	14:30
Sample Comments:	Soil results have been calculated and reported on a dry weight basis unless otherwise noted.				
Definitions:	Q: Qualifier (see definitions at end of report) NA: Not Applicable NN: Parameter not included in NELAC Scope of Analysis.				

Polynuclear Aromatic Hydrocarbons (PNAs) (EPA 3546/EPA 8270C)				Aliquot ID: 46662-006A		Matrix: Soil/Solid		Analyst: BDA	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
5. Benzo(a)pyrene (SIM)	U		µg/kg	330	20	10/07/11	PS11J07E	10/10/11	S511J10A
6. Benzo(b)fluoranthene (SIM)	U		µg/kg	330	20	10/07/11	PS11J07E	10/10/11	S511J10A
7. Benzo(ghi)perylene (SIM)	U		µg/kg	330	20	10/07/11	PS11J07E	10/10/11	S511J10A
8. Benzo(k)fluoranthene (SIM)	U		µg/kg	330	20	10/07/11	PS11J07E	10/10/11	S511J10A
9. Chrysene (SIM)	U		µg/kg	330	20	10/07/11	PS11J07E	10/10/11	S511J10A
10. Dibenzo(a,h)anthracene (SIM)	U		µg/kg	330	20	10/07/11	PS11J07E	10/10/11	S511J10A
11. Fluoranthene (SIM)	U		µg/kg	330	20	10/07/11	PS11J07E	10/10/11	S511J10A
12. Fluorene (SIM)	U		µg/kg	330	20	10/07/11	PS11J07E	10/10/11	S511J10A
13. Indeno(1,2,3-cd)pyrene (SIM)	U		µg/kg	330	20	10/07/11	PS11J07E	10/10/11	S511J10A
14. 2-Methylnaphthalene (SIM)	21000		µg/kg	330	20	10/07/11	PS11J07E	10/10/11	S511J10A
15. Phenanthrene (SIM)	U		µg/kg	330	20	10/07/11	PS11J07E	10/10/11	S511J10A
16. Pyrene (SIM)	U		µg/kg	330	20	10/07/11	PS11J07E	10/10/11	S511J10A

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Client Identification:	<b>Soil and Materials Engineers, Inc. - Lansing</b>	Sample Description:	<b>SB18-S2</b>	Chain of Custody:	<b>105664</b>
Client Project Name:	<b>Olivet Towers</b>	Sample No:	<b>7</b>	Collect Date:	<b>10/03/11</b>
Client Project No:	<b>062859.005</b>	Sample Matrix:	<b>Soil/Solid</b>	Collect Time:	<b>14:50</b>
Sample Comments:	<b>Soil results have been calculated and reported on a dry weight basis unless otherwise noted.</b>				
Definitions:	Q: Qualifier (see definitions at end of report) NA: Not Applicable NN: Parameter not included in NELAC Scope of Analysis.				

Dry Weight Determination (ASTM D 2974-87)				Aliquot ID: 46662-007A		Matrix: Soil/Solid		Analyst: BMG	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Percent Moisture (Water Content) (NN)	<b>16</b>		%	0.1	1.0	10/05/11	MC111005	10/06/11	MC111005

Michigan 10 Elements by ICP/MS (EPA 0200.2-M/EPA 6020A)				Aliquot ID: 46662-007A		Matrix: Soil/Solid		Analyst: JLH	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Arsenic	<b>2500</b>		µg/kg	100	20	10/10/11	PT11J10D	10/10/11	T211J10A
2. Barium	<b>90000</b>		µg/kg	1000	20	10/10/11	PT11J10D	10/10/11	T211J10A
3. Cadmium	<b>560</b>		µg/kg	50	20	10/10/11	PT11J10D	10/10/11	T211J10A
4. Chromium	<b>8600</b>		µg/kg	500	20	10/10/11	PT11J10D	10/10/11	T211J10A
5. Copper	<b>16000</b>		µg/kg	1000	20	10/10/11	PT11J10D	10/10/11	T211J10A
6. Lead	<b>130000</b>		µg/kg	1000	20	10/10/11	PT11J10D	10/10/11	T211J10A
7. Selenium	<b>440</b>		µg/kg	200	10	10/10/11	PT11J10D	10/10/11	T211J10A
8. Silver	<b>160</b>		µg/kg	100	20	10/10/11	PT11J10D	10/10/11	T211J10A
9. Zinc	<b>240000</b>		µg/kg	1000	20	10/10/11	PT11J10D	10/10/11	T211J10A

Mercury by CVAAS (EPA 7471B)				Aliquot ID: 46662-007A		Matrix: Soil/Solid		Analyst: MAP	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Mercury	<b>80</b>		µg/kg	50	10	10/07/11	PM11J07B	10/11/11	M411J11A

Polynuclear Aromatic Hydrocarbons (PNAs) (EPA 3546/EPA 8270C)				Aliquot ID: 46662-007A		Matrix: Soil/Solid		Analyst: BDA	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Acenaphthene (SIM)	U		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
2. Acenaphthylene (SIM)	U		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
3. Anthracene (SIM)	U		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
4. Benzo(a)anthracene (SIM)	U		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
5. Benzo(a)pyrene (SIM)	U		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
6. Benzo(b)fluoranthene (SIM)	U		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
7. Benzo(ghi)perylene (SIM)	U		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
8. Benzo(k)fluoranthene (SIM)	U		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
9. Chrysene (SIM)	U		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
10. Dibenzo(a,h)anthracene (SIM)	U		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
11. Fluoranthene (SIM)	U		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
12. Fluorene (SIM)	U		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
13. Indeno(1,2,3-cd)pyrene (SIM)	U		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
14. 2-Methylnaphthalene (SIM)	U		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
15. Naphthalene (SIM)	U		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
16. Phenanthrene (SIM)	U		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
17. Pyrene (SIM)	U		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A

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Client Identification:	<b>Soil and Materials Engineers, Inc. - Lansing</b>	Sample Description:	<b>SB20-S2</b>	Chain of Custody:	<b>105664</b>
Client Project Name:	<b>Olivet Towers</b>	Sample No:	<b>8</b>	Collect Date:	<b>10/03/11</b>
Client Project No:	<b>062859.005</b>	Sample Matrix:	<b>Soil/Solid</b>	Collect Time:	<b>15:15</b>
Sample Comments:	<b>Soil results have been calculated and reported on a dry weight basis unless otherwise noted.</b>				
Definitions:	Q: Qualifier (see definitions at end of report) NA: Not Applicable NN: Parameter not included in NELAC Scope of Analysis.				

Dry Weight Determination (ASTM D 2974-87)				Aliquot ID: 46662-008A		Matrix: Soil/Solid		Analyst: BMG	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Percent Moisture (Water Content) (NN)	13		%	0.1	1.0	10/05/11	MC111005	10/06/11	MC111005

Michigan 10 Elements by ICP/MS (EPA 0200.2-M/EPA 6020A)				Aliquot ID: 46662-008A		Matrix: Soil/Solid		Analyst: JLH	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Arsenic	2100		µg/kg	100	20	10/10/11	PT11J10D	10/10/11	T211J10A
2. Barium	21000		µg/kg	1000	20	10/10/11	PT11J10D	10/10/11	T211J10A
3. Cadmium	82		µg/kg	50	20	10/10/11	PT11J10D	10/10/11	T211J10A
4. Chromium	6100		µg/kg	500	20	10/10/11	PT11J10D	10/10/11	T211J10A
5. Copper	3600		µg/kg	1000	20	10/10/11	PT11J10D	10/10/11	T211J10A
6. Lead	5300		µg/kg	1000	20	10/10/11	PT11J10D	10/10/11	T211J10A
7. Selenium	310		µg/kg	200	20	10/10/11	PT11J10D	10/10/11	T211J10A
8. Silver	U		µg/kg	100	20	10/10/11	PT11J10D	10/10/11	T211J10A
9. Zinc	14000		µg/kg	1000	20	10/10/11	PT11J10D	10/10/11	T211J10A

Mercury by CVAAS (EPA 7471B)				Aliquot ID: 46662-008A		Matrix: Soil/Solid		Analyst: MAP	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Mercury	U		µg/kg	50	10	10/07/11	PM11J07B	10/11/11	M411J11A

Polychlorinated Biphenyls (PCBs) (EPA 3546/EPA 8082A)				Aliquot ID: 46662-008A		Matrix: Soil/Solid		Analyst: BDA	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Aroclor-1016	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
2. Aroclor-1221	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
3. Aroclor-1232	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
4. Aroclor-1242	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
5. Aroclor-1248	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
6. Aroclor-1254	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
7. Aroclor-1260	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
8. Aroclor-1262 (NN)	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
9. Aroclor-1268 (NN)	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A

Polynuclear Aromatic Hydrocarbons (PNAs) (EPA 3546/EPA 8270C)				Aliquot ID: 46662-008A		Matrix: Soil/Solid		Analyst: HLS	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Acenaphthene (SIM)	U		µg/kg	330	1.0	10/10/11	PS11J10A	10/10/11	S611J10A
2. Acenaphthylene (SIM)	U		µg/kg	330	1.0	10/10/11	PS11J10A	10/10/11	S611J10A
3. Anthracene (SIM)	U	J,L-	µg/kg	330	1.0	10/10/11	PS11J10A	10/10/11	S611J10A
4. Benzo(a)anthracene (SIM)	U		µg/kg	330	1.0	10/10/11	PS11J10A	10/10/11	S611J10A

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Client Identification:	<b>Soil and Materials Engineers, Inc. - Lansing</b>	Sample Description:	<b>SB20-S2</b>	Chain of Custody:	<b>105664</b>
Client Project Name:	<b>Olivet Towers</b>	Sample No:	<b>8</b>	Collect Date:	<b>10/03/11</b>
Client Project No:	<b>062859.005</b>	Sample Matrix:	<b>Soil/Solid</b>	Collect Time:	<b>15:15</b>
Sample Comments:	<b>Soil results have been calculated and reported on a dry weight basis unless otherwise noted.</b>				
Definitions:	Q: Qualifier (see definitions at end of report) NA: Not Applicable NN: Parameter not included in NELAC Scope of Analysis.				

Polynuclear Aromatic Hydrocarbons (PNAs) (EPA 3546/EPA 8270C)				Aliquot ID: 46662-008A		Matrix: Soil/Solid		Analyst: HLS	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
5. Benzo(a)pyrene (SIM)	U		µg/kg	330	1.0	10/10/11	PS11J10A	10/10/11	S611J10A
6. Benzo(b)fluoranthene (SIM)	U		µg/kg	330	1.0	10/10/11	PS11J10A	10/10/11	S611J10A
7. Benzo(ghi)perylene (SIM)	U		µg/kg	330	1.0	10/10/11	PS11J10A	10/10/11	S611J10A
8. Benzo(k)fluoranthene (SIM)	U		µg/kg	330	1.0	10/10/11	PS11J10A	10/10/11	S611J10A
9. Chrysene (SIM)	U		µg/kg	330	1.0	10/10/11	PS11J10A	10/10/11	S611J10A
10. Dibenzo(a,h)anthracene (SIM)	U		µg/kg	330	1.0	10/10/11	PS11J10A	10/10/11	S611J10A
11. Fluoranthene (SIM)	U		µg/kg	330	1.0	10/10/11	PS11J10A	10/10/11	S611J10A
12. Fluorene (SIM)	U		µg/kg	330	1.0	10/10/11	PS11J10A	10/10/11	S611J10A
13. Indeno(1,2,3-cd)pyrene (SIM)	U		µg/kg	330	1.0	10/10/11	PS11J10A	10/10/11	S611J10A
14. 2-Methylnaphthalene (SIM)	U		µg/kg	330	1.0	10/10/11	PS11J10A	10/10/11	S611J10A
15. Naphthalene (SIM)	U		µg/kg	330	1.0	10/10/11	PS11J10A	10/10/11	S611J10A
16. Phenanthrene (SIM)	U		µg/kg	330	1.0	10/10/11	PS11J10A	10/10/11	S611J10A
17. Pyrene (SIM)	U		µg/kg	330	1.0	10/10/11	PS11J10A	10/10/11	S611J10A

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Client Identification:	Soil and Materials Engineers, Inc. - Lansing	Sample Description:	SB7/MS	Chain of Custody:	105664
Client Project Name:	Olivet Towers	Sample No:	9	Collect Date:	10/03/11
Client Project No:	062859.005	Sample Matrix:	Soil/Solid	Collect Time:	11:00
Sample Comments:	Soil results have been calculated and reported on a dry weight basis unless otherwise noted.				
Definitions:	Q: Qualifier (see definitions at end of report) NA: Not Applicable NN: Parameter not included in NELAC Scope of Analysis.				

Dry Weight Determination (ASTM D 2974-87)				Aliquot ID: 46662-009		Matrix: Soil/Solid		Analyst: BMG	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Percent Moisture (Water Content) (NN)	9.3		%	0.1	1.0	10/05/11	MC111005	10/06/11	MC111005

Michigan 10 Elements by ICP/MS (EPA 0200.2-M/EPA 6020A)				Aliquot ID: 46662-009		Matrix: Soil/Solid		Analyst: JLH	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Arsenic	15000		µg/kg	100	20	10/10/11	PT11J10D	10/10/11	T211J10A
2. Barium	110000		µg/kg	1000	20	10/10/11	PT11J10D	10/10/11	T211J10A
3. Cadmium	11000		µg/kg	50	20	10/10/11	PT11J10D	10/10/11	T211J10A
4. Chromium	29000		µg/kg	500	20	10/10/11	PT11J10D	10/10/11	T211J10A
5. Copper	34000		µg/kg	1000	20	10/10/11	PT11J10D	10/10/11	T211J10A
6. Lead	64000		µg/kg	1000	20	10/10/11	PT11J10D	10/10/11	T211J10A
7. Selenium	8900		µg/kg	200	20	10/10/11	PT11J10D	10/10/11	T211J10A
8. Silver	9800		µg/kg	100	20	10/10/11	PT11J10D	10/10/11	T211J10A
9. Zinc	120000		µg/kg	1000	20	10/10/11	PT11J10D	10/10/11	T211J10A

Mercury by CVAAS (EPA 7471B)				Aliquot ID: 46662-009		Matrix: Soil/Solid		Analyst: MAP	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Mercury	330		µg/kg	50	10	10/07/11	PM11J07B	10/11/11	M411J11A

Polynuclear Aromatic Hydrocarbons (PNAs) (EPA 3546/EPA 8270C)				Aliquot ID: 46662-009		Matrix: Soil/Solid		Analyst: BDA	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Acenaphthene (SIM)	4800		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
2. Acenaphthylene (SIM)	5100		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
3. Anthracene (SIM)	4900		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
4. Benzo(a)anthracene (SIM)	5600		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
5. Benzo(a)pyrene (SIM)	5100		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
6. Benzo(b)fluoranthene (SIM)	5100		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
7. Benzo(ghi)perylene (SIM)	5700		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
8. Benzo(k)fluoranthene (SIM)	4900		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
9. Chrysene (SIM)	5300		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
10. Dibenzo(a,h)anthracene (SIM)	5800		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
11. Fluoranthene (SIM)	5600		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
12. Fluorene (SIM)	5100		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
13. Indeno(1,2,3-cd)pyrene (SIM)	5900		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
14. 2-Methylnaphthalene (SIM)	4600		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
15. Naphthalene (SIM)	4200		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
16. Phenanthrene (SIM)	5300		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
17. Pyrene (SIM)	5700		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A

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Client Identification:	Soil and Materials Engineers, Inc. - Lansing	Sample Description:	SB7/MSD	Chain of Custody:	105664
Client Project Name:	Olivet Towers	Sample No:	10	Collect Date:	10/03/11
Client Project No:	062859.005	Sample Matrix:	Soil/Solid	Collect Time:	11:00
Sample Comments:	Soil results have been calculated and reported on a dry weight basis unless otherwise noted.				
Definitions:	Q: Qualifier (see definitions at end of report) NA: Not Applicable NN: Parameter not included in NELAC Scope of Analysis.				

Dry Weight Determination (ASTM D 2974-87)				Aliquot ID: 46662-010		Matrix: Soil/Solid		Analyst: BMG	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Percent Moisture (Water Content) (NN)	15		%	0.1	1.0	10/05/11	MC111005	10/06/11	MC111005

Michigan 10 Elements by ICP/MS (EPA 0200.2-M/EPA 6020A)				Aliquot ID: 46662-010		Matrix: Soil/Solid		Analyst: JLH	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Arsenic	14000		µg/kg	100	20	10/10/11	PT11J10D	10/10/11	T211J10A
2. Barium	120000		µg/kg	1000	20	10/10/11	PT11J10D	10/10/11	T211J10A
3. Cadmium	10000		µg/kg	50	20	10/10/11	PT11J10D	10/10/11	T211J10A
4. Chromium	29000		µg/kg	500	20	10/10/11	PT11J10D	10/10/11	T211J10A
5. Copper	31000		µg/kg	1000	20	10/10/11	PT11J10D	10/10/11	T211J10A
6. Lead	55000		µg/kg	1000	20	10/10/11	PT11J10D	10/10/11	T211J10A
7. Selenium	8600		µg/kg	200	20	10/10/11	PT11J10D	10/10/11	T211J10A
8. Silver	8800		µg/kg	100	20	10/10/11	PT11J10D	10/10/11	T211J10A
9. Zinc	120000		µg/kg	1000	20	10/10/11	PT11J10D	10/10/11	T211J10A

Mercury by CVAAS (EPA 7471B)				Aliquot ID: 46662-010		Matrix: Soil/Solid		Analyst: MAP	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Mercury	410		µg/kg	50	10	10/07/11	PM11J07B	10/11/11	M411J11A

Polynuclear Aromatic Hydrocarbons (PNAs) (EPA 3546/EPA 8270C)				Aliquot ID: 46662-010		Matrix: Soil/Solid		Analyst: BDA	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Acenaphthene (SIM)	5000		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
2. Acenaphthylene (SIM)	5200		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
3. Anthracene (SIM)	5100		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
4. Benzo(a)anthracene (SIM)	5800		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
5. Benzo(a)pyrene (SIM)	5200		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
6. Benzo(b)fluoranthene (SIM)	5300		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
7. Benzo(ghi)perylene (SIM)	5900		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
8. Benzo(k)fluoranthene (SIM)	5000		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
9. Chrysene (SIM)	5500		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
10. Dibenzo(a,h)anthracene (SIM)	5900		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
11. Fluoranthene (SIM)	5800		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
12. Fluorene (SIM)	5300		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
13. Indeno(1,2,3-cd)pyrene (SIM)	6100		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
14. 2-Methylnaphthalene (SIM)	4800		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
15. Naphthalene (SIM)	4500		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
16. Phenanthrene (SIM)	5400		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A
17. Pyrene (SIM)	5900		µg/kg	330	10	10/07/11	PS11J07E	10/07/11	S511J07A

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Client Identification:	Soil and Materials Engineers, Inc. - Lansing	Sample Description:	DUPLICATE #1	Chain of Custody:	105664
Client Project Name:	Olivet Towers	Sample No:	11	Collect Date:	10/03/11
Client Project No:	062859.005	Sample Matrix:	Soil/Solid	Collect Time:	NA
Sample Comments:	Soil results have been calculated and reported on a dry weight basis unless otherwise noted.				
Definitions:	Q: Qualifier (see definitions at end of report) NA: Not Applicable NN: Parameter not included in NELAC Scope of Analysis.				

Dry Weight Determination (ASTM D 2974-87)				Aliquot ID: 46662-011		Matrix: Soil/Solid		Analyst: BMG	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Percent Moisture (Water Content) (NN)	13		%	0.1	1.0	10/05/11	MC111005	10/06/11	MC111005

Michigan 10 Elements by ICP/MS (EPA 0200.2-M/EPA 6020A)				Aliquot ID: 46662-011		Matrix: Soil/Solid		Analyst: JLH	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Arsenic	8200		µg/kg	100	20	10/10/11	PT11J10D	10/10/11	T211J10A
2. Barium	260000		µg/kg	1000	20	10/10/11	PT11J10D	10/10/11	T211J10A
3. Cadmium	320		µg/kg	50	20	10/10/11	PT11J10D	10/10/11	T211J10A
4. Chromium	12000		µg/kg	500	20	10/10/11	PT11J10D	10/10/11	T211J10A
5. Copper	18000		µg/kg	1000	20	10/10/11	PT11J10D	10/10/11	T211J10A
6. Lead	2000000		µg/kg	1000	200	10/10/11	PT11J10D	10/10/11	T211J10A
7. Selenium	390		µg/kg	200	20	10/10/11	PT11J10D	10/10/11	T211J10A
8. Silver	120		µg/kg	100	20	10/10/11	PT11J10D	10/10/11	T211J10A
9. Zinc	240000		µg/kg	1000	20	10/10/11	PT11J10D	10/10/11	T211J10A

Mercury by CVAAS (EPA 7471B)				Aliquot ID: 46662-011		Matrix: Soil/Solid		Analyst: MAP	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Mercury	68		µg/kg	50	10	10/07/11	PM11J07B	10/11/11	M411J11A

Polynuclear Aromatic Hydrocarbons (PNAs) (EPA 3546/EPA 8270C)				Aliquot ID: 46662-011		Matrix: Soil/Solid		Analyst: BDA	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Acenaphthene (SIM)	U		µg/kg	330	20	10/07/11	PS11J07E	10/07/11	S511J07A
2. Acenaphthylene (SIM)	U		µg/kg	330	20	10/07/11	PS11J07E	10/07/11	S511J07A
3. Anthracene (SIM)	U		µg/kg	330	20	10/07/11	PS11J07E	10/07/11	S511J07A
4. Benzo(a)anthracene (SIM)	390		µg/kg	330	20	10/07/11	PS11J07E	10/07/11	S511J07A
5. Benzo(a)pyrene (SIM)	U		µg/kg	330	20	10/07/11	PS11J07E	10/07/11	S511J07A
6. Benzo(b)fluoranthene (SIM)	U		µg/kg	330	20	10/07/11	PS11J07E	10/07/11	S511J07A
7. Benzo(ghi)perylene (SIM)	U		µg/kg	330	20	10/07/11	PS11J07E	10/07/11	S511J07A
8. Benzo(k)fluoranthene (SIM)	U		µg/kg	330	20	10/07/11	PS11J07E	10/07/11	S511J07A
9. Chrysene (SIM)	U		µg/kg	330	20	10/07/11	PS11J07E	10/07/11	S511J07A
10. Dibenzo(a,h)anthracene (SIM)	U		µg/kg	330	20	10/07/11	PS11J07E	10/07/11	S511J07A
11. Fluoranthene (SIM)	U		µg/kg	330	20	10/07/11	PS11J07E	10/07/11	S511J07A
12. Fluorene (SIM)	U		µg/kg	330	20	10/07/11	PS11J07E	10/07/11	S511J07A
13. Indeno(1,2,3-cd)pyrene (SIM)	U		µg/kg	330	20	10/07/11	PS11J07E	10/07/11	S511J07A
14. 2-Methylnaphthalene (SIM)	U		µg/kg	330	20	10/07/11	PS11J07E	10/07/11	S511J07A
15. Naphthalene (SIM)	U		µg/kg	330	20	10/07/11	PS11J07E	10/07/11	S511J07A
16. Phenanthrene (SIM)	U		µg/kg	330	20	10/07/11	PS11J07E	10/07/11	S511J07A
17. Pyrene (SIM)	U		µg/kg	330	20	10/07/11	PS11J07E	10/07/11	S511J07A

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Client Identification: <b>Soil and Materials Engineers, Inc. - Lansing</b>	Sample Description: <b>SB10-S1</b>	Chain of Custody: <b>105666</b>
Client Project Name: <b>Olivet Towers</b>	Sample No: <b>12</b>	Collect Date: <b>10/03/11</b>
Client Project No: <b>062859.005</b>	Sample Matrix: <b>Soil/Solid</b>	Collect Time: <b>15:40</b>

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable NN: Parameter not included in NELAC Scope of Analysis.

Dry Weight Determination (ASTM D 2974-87)				Aliquot ID: 46662-012A		Matrix: Soil/Solid		Analyst: BMG	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Percent Moisture (Water Content) (NN)	8.5		%	0.1	1.0	10/05/11	MC111005	10/06/11	MC111005

Michigan 10 Elements by ICP/MS (EPA 0200.2-M/EPA 6020A)				Aliquot ID: 46662-012A		Matrix: Soil/Solid		Analyst: JLH	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Arsenic	1500		µg/kg	100	20	10/10/11	PT11J10D	10/10/11	T211J10A
2. Barium	15000		µg/kg	1000	20	10/10/11	PT11J10D	10/10/11	T211J10A
3. Cadmium	64		µg/kg	50	20	10/10/11	PT11J10D	10/10/11	T211J10A
4. Chromium	4900		µg/kg	500	20	10/10/11	PT11J10D	10/10/11	T211J10A
5. Copper	5400		µg/kg	1000	20	10/10/11	PT11J10D	10/10/11	T211J10A
6. Lead	4000		µg/kg	1000	20	10/10/11	PT11J10D	10/10/11	T211J10A
7. Selenium	U		µg/kg	200	20	10/10/11	PT11J10D	10/10/11	T211J10A
8. Silver	U		µg/kg	100	20	10/10/11	PT11J10D	10/10/11	T211J10A
9. Zinc	13000		µg/kg	1000	20	10/10/11	PT11J10D	10/10/11	T211J10A

Mercury by CVAAS (EPA 7471B)				Aliquot ID: 46662-012A		Matrix: Soil/Solid		Analyst: MAP	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Mercury	U		µg/kg	50	10	10/07/11	PM11J07B	10/11/11	M411J11A

Polychlorinated Biphenyls (PCBs) (EPA 3546/EPA 8082A)				Aliquot ID: 46662-012A		Matrix: Soil/Solid		Analyst: BDA	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Aroclor-1016	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
2. Aroclor-1221	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
3. Aroclor-1232	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
4. Aroclor-1242	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
5. Aroclor-1248	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
6. Aroclor-1254	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
7. Aroclor-1260	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
8. Aroclor-1262 (NN)	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A
9. Aroclor-1268 (NN)	U		µg/kg	330	5.0	10/10/11	PS11J10A	10/10/11	SB11J10A

Polynuclear Aromatic Hydrocarbons (PNAs) (EPA 3546/EPA 8270C)				Aliquot ID: 46662-012A		Matrix: Soil/Solid		Analyst: HLS	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Acenaphthene	U		µg/kg	330	1.0	10/10/11	PS11J10A	10/10/11	S711J10B
2. Acenaphthylene	U		µg/kg	330	1.0	10/10/11	PS11J10A	10/10/11	S711J10B
3. Anthracene	U	J,L-	µg/kg	330	1.0	10/10/11	PS11J10A	10/10/11	S711J10B
4. Benzo(a)anthracene	U		µg/kg	330	1.0	10/10/11	PS11J10A	10/10/11	S711J10B

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Client Identification: <b>Soil and Materials Engineers, Inc. - Lansing</b>	Sample Description: <b>SB10-S1</b>	Chain of Custody: <b>105666</b>
Client Project Name: <b>Olivet Towers</b>	Sample No: <b>12</b>	Collect Date: <b>10/03/11</b>
Client Project No: <b>062859.005</b>	Sample Matrix: <b>Soil/Solid</b>	Collect Time: <b>15:40</b>

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable NN: Parameter not included in NELAC Scope of Analysis.

Polynuclear Aromatic Hydrocarbons (PNAs) (EPA 3546/EPA 8270C)				Aliquot ID: 46662-012A		Matrix: Soil/Solid		Analyst: HLS	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
5. Benzo(a)pyrene	U		µg/kg	330	1.0	10/10/11	PS11J10A	10/10/11	S711J10B
6. Benzo(b)fluoranthene	U		µg/kg	330	1.0	10/10/11	PS11J10A	10/10/11	S711J10B
7. Benzo(ghi)perylene	U		µg/kg	330	1.0	10/10/11	PS11J10A	10/10/11	S711J10B
8. Benzo(k)fluoranthene	U		µg/kg	330	1.0	10/10/11	PS11J10A	10/10/11	S711J10B
9. Chrysene	U		µg/kg	330	1.0	10/10/11	PS11J10A	10/10/11	S711J10B
10. Dibenzo(a,h)anthracene	U		µg/kg	330	1.0	10/10/11	PS11J10A	10/10/11	S711J10B
11. Fluoranthene	U		µg/kg	330	1.0	10/10/11	PS11J10A	10/10/11	S711J10B
12. Fluorene	U		µg/kg	330	1.0	10/10/11	PS11J10A	10/10/11	S711J10B
13. Indeno(1,2,3-cd)pyrene	U		µg/kg	330	1.0	10/10/11	PS11J10A	10/10/11	S711J10B
14. 2-Methylnaphthalene	U		µg/kg	330	1.0	10/10/11	PS11J10A	10/10/11	S711J10B
15. Naphthalene	U		µg/kg	330	1.0	10/10/11	PS11J10A	10/10/11	S711J10B
16. Phenanthrene	U		µg/kg	330	1.0	10/10/11	PS11J10A	10/10/11	S711J10B
17. Pyrene	U		µg/kg	330	1.0	10/10/11	PS11J10A	10/10/11	S711J10B

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Client Identification:	Soil and Materials Engineers, Inc. - Lansing	Sample Description:	SB12-S4	Chain of Custody:	105666
Client Project Name:	Olivet Towers	Sample No:	13	Collect Date:	10/03/11
Client Project No:	062859.005	Sample Matrix:	Soil/Solid	Collect Time:	16:00
Sample Comments:	Soil results have been calculated and reported on a dry weight basis unless otherwise noted.				
Definitions:	Q: Qualifier (see definitions at end of report) NA: Not Applicable NN: Parameter not included in NELAC Scope of Analysis.				

Dry Weight Determination (ASTM D 2974-87)				Aliquot ID: 46662-013A		Matrix: Soil/Solid		Analyst: BMG	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Percent Moisture (Water Content) (NN)	10		%	0.1	1.0	10/05/11	MC111005	10/06/11	MC111005

Trace Elements by ICP/MS (EPA 0200.2-M/EPA 6020A)				Aliquot ID: 46662-013A		Matrix: Soil/Solid		Analyst: JLH	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Lead	6400		µg/kg	1000	20	10/10/11	PT11J10D	10/10/11	T211J10A

Volatile Organic Compounds (VOCs) by GC/MS, 5035 (EPA 5035/EPA 8260B)				Aliquot ID: 46662-013		Matrix: Soil/Solid		Analyst: JAS	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Acetone	U		µg/kg	1000	1.0	10/05/11	V911J05A	10/05/11	V911J05A
2. Acrylonitrile	U		µg/kg	110	1.0	10/05/11	V911J05A	10/05/11	V911J05A
3. Benzene	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
4. Bromobenzene	U		µg/kg	100	1.0	10/05/11	V911J05A	10/05/11	V911J05A
5. Bromochloromethane	U		µg/kg	110	1.0	10/05/11	V911J05A	10/05/11	V911J05A
6. Bromodichloromethane	U		µg/kg	100	1.0	10/05/11	V911J05A	10/05/11	V911J05A
7. Bromoform	U		µg/kg	100	1.0	10/05/11	V911J05A	10/05/11	V911J05A
8. Bromomethane	U		µg/kg	200	1.0	10/05/11	V911J05A	10/05/11	V911J05A
9. 2-Butanone	U		µg/kg	750	1.0	10/05/11	V911J05A	10/05/11	V911J05A
10. n-Butylbenzene	3400		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
11. sec-Butylbenzene	1000		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
12. tert-Butylbenzene	260		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
13. Carbon Disulfide	U		µg/kg	250	1.0	10/05/11	V911J05A	10/05/11	V911J05A
14. Carbon Tetrachloride	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
15. Chlorobenzene	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
16. Chloroethane	U		µg/kg	250	1.0	10/05/11	V911J05A	10/05/11	V911J05A
17. Chloroform	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
18. Chloromethane	U		µg/kg	250	1.0	10/05/11	V911J05A	10/05/11	V911J05A
19. 2-Chlorotoluene	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
20. Dibromochloromethane	U		µg/kg	110	1.0	10/05/11	V911J05A	10/05/11	V911J05A
21. 1,2-Dibromo-3-chloropropane (NN)	U		µg/kg	10	1.0	10/05/11	V911J05A	10/05/11	V911J05A
22. Dibromomethane	U		µg/kg	250	1.0	10/05/11	V911J05A	10/05/11	V911J05A
23. 1,2-Dichlorobenzene	U		µg/kg	100	1.0	10/05/11	V911J05A	10/05/11	V911J05A
24. 1,3-Dichlorobenzene	U		µg/kg	100	1.0	10/05/11	V911J05A	10/05/11	V911J05A
25. 1,4-Dichlorobenzene	U		µg/kg	100	1.0	10/05/11	V911J05A	10/05/11	V911J05A
26. Dichlorodifluoromethane	U		µg/kg	250	1.0	10/05/11	V911J05A	10/05/11	V911J05A
27. 1,1-Dichloroethane	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
28. 1,2-Dichloroethane	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
29. 1,1-Dichloroethene	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A

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Client Identification: <b>Soil and Materials Engineers, Inc. - Lansing</b>	Sample Description: <b>SB12-S4</b>	Chain of Custody: <b>105666</b>
Client Project Name: <b>Olivet Towers</b>	Sample No: <b>13</b>	Collect Date: <b>10/03/11</b>
Client Project No: <b>062859.005</b>	Sample Matrix: <b>Soil/Solid</b>	Collect Time: <b>16:00</b>

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable NN: Parameter not included in NELAC Scope of Analysis.

Volatile Organic Compounds (VOCs) by GC/MS, 5035 (EPA 5035/EPA 8260B)				Aliquot ID: 46662-013		Matrix: Soil/Solid		Analyst: JAS	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
30. cis-1,2-Dichloroethene	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
31. trans-1,2-Dichloroethene	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
32. 1,2-Dichloropropane	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
33. cis-1,3-Dichloropropene	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
34. trans-1,3-Dichloropropene	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
35. Ethylbenzene	4100		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
36. Ethylene Dibromide	U		µg/kg	20	1.0	10/05/11	V911J05A	10/05/11	V911J05A
37. 2-Hexanone	U		µg/kg	2500	1.0	10/05/11	V911J05A	10/05/11	V911J05A
38. Isopropylbenzene	1300		µg/kg	250	1.0	10/05/11	V911J05A	10/05/11	V911J05A
39. Methyl Iodide	U		µg/kg	100	1.0	10/05/11	V911J05A	10/05/11	V911J05A
40. Methylene Chloride	U		µg/kg	100	1.0	10/05/11	V911J05A	10/05/11	V911J05A
41. 4-Methyl-2-pentanone	U		µg/kg	2500	1.0	10/05/11	V911J05A	10/05/11	V911J05A
42. MTBE	U		µg/kg	250	1.0	10/05/11	V911J05A	10/05/11	V911J05A
43. Naphthalene	1500		µg/kg	330	1.0	10/05/11	V911J05A	10/05/11	V911J05A
44. n-Propylbenzene	4500		µg/kg	100	1.0	10/05/11	V911J05A	10/05/11	V911J05A
45. Styrene	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
46. 1,1,1,2-Tetrachloroethane	U		µg/kg	110	1.0	10/05/11	V911J05A	10/05/11	V911J05A
47. 1,1,2,2-Tetrachloroethane	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
48. Tetrachloroethene	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
49. Toluene	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
50. 1,2,4-Trichlorobenzene	U		µg/kg	330	1.0	10/05/11	V911J05A	10/05/11	V911J05A
51. 1,1,1-Trichloroethane	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
52. 1,1,2-Trichloroethane	U		µg/kg	50	1.0	10/05/11	V911J05A	10/05/11	V911J05A
53. Trichloroethene	U		µg/kg	56	1.0	10/05/11	V911J05A	10/05/11	V911J05A
54. Trichlorofluoromethane	U		µg/kg	100	1.0	10/05/11	V911J05A	10/05/11	V911J05A
55. 1,2,3-Trichloropropane	U		µg/kg	100	1.0	10/05/11	V911J05A	10/05/11	V911J05A
56. 1,2,3-Trimethylbenzene (NN)	5300		µg/kg	100	1.0	10/05/11	V911J05A	10/05/11	V911J05A
57. 1,2,4-Trimethylbenzene	5400		µg/kg	100	1.0	10/05/11	V911J05A	10/05/11	V911J05A
58. 1,3,5-Trimethylbenzene	4000		µg/kg	100	1.0	10/05/11	V911J05A	10/05/11	V911J05A
59. Vinyl Chloride	U		µg/kg	40	1.0	10/05/11	V911J05A	10/05/11	V911J05A
60. Xylenes	2400		µg/kg	150	1.0	10/05/11	V911J05A	10/05/11	V911J05A

Polynuclear Aromatic Hydrocarbons (PNAs) (EPA 3546/EPA 8270C)				Aliquot ID: 46662-013A		Matrix: Soil/Solid		Analyst: BDA	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Acenaphthene (SIM)	U		µg/kg	330	1.0	10/07/11	PS11J07E	10/07/11	S511J07A
2. Acenaphthylene (SIM)	U		µg/kg	330	1.0	10/07/11	PS11J07E	10/07/11	S511J07A
3. Anthracene (SIM)	U		µg/kg	330	1.0	10/07/11	PS11J07E	10/07/11	S511J07A
4. Benzo(a)anthracene (SIM)	U		µg/kg	330	1.0	10/07/11	PS11J07E	10/07/11	S511J07A

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F: (517) 699-0388  
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Client Identification:	<b>Soil and Materials Engineers, Inc. - Lansing</b>	Sample Description:	<b>SB12-S4</b>	Chain of Custody:	<b>105666</b>
Client Project Name:	<b>Olivet Towers</b>	Sample No:	<b>13</b>	Collect Date:	<b>10/03/11</b>
Client Project No:	<b>062859.005</b>	Sample Matrix:	<b>Soil/Solid</b>	Collect Time:	<b>16:00</b>

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable NN: Parameter not included in NELAC Scope of Analysis.

Polynuclear Aromatic Hydrocarbons (PNAs) (EPA 3546/EPA 8270C)				Aliquot ID: 46662-013A		Matrix: Soil/Solid		Analyst: BDA	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
5. Benzo(a)pyrene (SIM)	U		µg/kg	330	1.0	10/07/11	PS11J07E	10/07/11	S511J07A
6. Benzo(b)fluoranthene (SIM)	U		µg/kg	330	1.0	10/07/11	PS11J07E	10/07/11	S511J07A
7. Benzo(ghi)perylene (SIM)	U		µg/kg	330	1.0	10/07/11	PS11J07E	10/07/11	S511J07A
8. Benzo(k)fluoranthene (SIM)	U		µg/kg	330	1.0	10/07/11	PS11J07E	10/07/11	S511J07A
9. Chrysene (SIM)	U		µg/kg	330	1.0	10/07/11	PS11J07E	10/07/11	S511J07A
10. Dibenzo(a,h)anthracene (SIM)	U		µg/kg	330	1.0	10/07/11	PS11J07E	10/07/11	S511J07A
11. Fluoranthene (SIM)	U		µg/kg	330	1.0	10/07/11	PS11J07E	10/07/11	S511J07A
12. Fluorene (SIM)	U		µg/kg	330	1.0	10/07/11	PS11J07E	10/07/11	S511J07A
13. Indeno(1,2,3-cd)pyrene (SIM)	U		µg/kg	330	1.0	10/07/11	PS11J07E	10/07/11	S511J07A
14. 2-Methylnaphthalene (SIM)	1600		µg/kg	330	1.0	10/07/11	PS11J07E	10/07/11	S511J07A
15. Naphthalene (SIM)	890		µg/kg	330	1.0	10/07/11	PS11J07E	10/07/11	S511J07A
16. Phenanthrene (SIM)	U		µg/kg	330	1.0	10/07/11	PS11J07E	10/07/11	S511J07A
17. Pyrene (SIM)	U		µg/kg	330	1.0	10/07/11	PS11J07E	10/07/11	S511J07A

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Client Identification: <b>Soil and Materials Engineers, Inc. - Lansing</b>	Sample Description: <b>TRIP BLANK</b>	Chain of Custody: <b>105666</b>
Client Project Name: <b>Olivet Towers</b>	Sample No: <b>15</b>	Collect Date: <b>10/03/11</b>
Client Project No: <b>062859.005</b>	Sample Matrix: <b>Ground Water</b>	Collect Time: <b>NA</b>

Sample Comments:

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable NN: Parameter not included in NELAC Scope of Analysis.

Volatile Organic Compounds (VOCs) by GC/MS (EPA 5030B/EPA 8260B)				Aliquot ID: 46662-015		Matrix: Ground Water		Analyst: CDH	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Acetone	U		µg/L	50	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
2. Acrylonitrile	U		µg/L	2.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
3. Benzene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
4. Bromobenzene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
5. Bromochloromethane	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
6. Bromodichloromethane	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
7. Bromoform	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
8. Bromomethane	U		µg/L	5.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
9. 2-Butanone	U		µg/L	25	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
10. n-Butylbenzene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
11. sec-Butylbenzene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
12. tert-Butylbenzene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
13. Carbon Disulfide	U		µg/L	5.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
14. Carbon Tetrachloride	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
15. Chlorobenzene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
16. Chloroethane	U		µg/L	5.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
17. Chloroform	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
18. Chloromethane	U		µg/L	5.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
19. 2-Chlorotoluene	U		µg/L	5.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
20. Dibromochloromethane	U		µg/L	5.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
21. 1,2-Dibromo-3-chloropropane (NN)	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
22. Dibromomethane	U		µg/L	5.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
23. 1,2-Dichlorobenzene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
24. 1,3-Dichlorobenzene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
25. 1,4-Dichlorobenzene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
26. Dichlorodifluoromethane	U		µg/L	5.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
27. 1,1-Dichloroethane	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
28. 1,2-Dichloroethane	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
29. 1,1-Dichloroethene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
30. cis-1,2-Dichloroethene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
31. trans-1,2-Dichloroethene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
32. 1,2-Dichloropropane	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
33. cis-1,3-Dichloropropene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
34. trans-1,3-Dichloropropene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
35. Ethylbenzene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
36. Ethylene Dibromide	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
37. 2-Hexanone	U		µg/L	50	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
38. Isopropylbenzene	U		µg/L	5.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
39. Methyl Iodide	U		µg/L	5.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A

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Client Identification:	<b>Soil and Materials Engineers, Inc. - Lansing</b>	Sample Description:	<b>TRIP BLANK</b>	Chain of Custody:	<b>105666</b>
Client Project Name:	<b>Olivet Towers</b>	Sample No:	<b>15</b>	Collect Date:	<b>10/03/11</b>
Client Project No:	<b>062859.005</b>	Sample Matrix:	<b>Ground Water</b>	Collect Time:	<b>NA</b>

**Sample Comments:**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable NN: Parameter not included in NELAC Scope of Analysis.

Volatile Organic Compounds (VOCs) by GC/MS (EPA 5030B/EPA 8260B)				Aliquot ID: 46662-015		Matrix: Ground Water		Analyst: CDH	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
40. Methylene Chloride	U		µg/L	5.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
41. 2-Methylnaphthalene (NN)	U		µg/L	5.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
42. 4-Methyl-2-pentanone	U		µg/L	50	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
43. MTBE	U		µg/L	5.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
44. Naphthalene	U		µg/L	5.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
45. n-Propylbenzene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
46. Styrene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
47. 1,1,1,2-Tetrachloroethane	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
48. 1,1,2,2-Tetrachloroethane	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
49. Tetrachloroethene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
50. Toluene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
51. 1,2,4-Trichlorobenzene	U		µg/L	5.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
52. 1,1,1-Trichloroethane	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
53. 1,1,2-Trichloroethane	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
54. Trichloroethene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
55. Trichlorofluoromethane	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
56. 1,2,3-Trichloropropane	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
57. 1,2,3-Trimethylbenzene (NN)	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
58. 1,2,4-Trimethylbenzene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
59. 1,3,5-Trimethylbenzene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
60. Vinyl Chloride	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
61. Xylenes	U		µg/L	3.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A

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Client Identification:	<b>Soil and Materials Engineers, Inc. - Lansing</b>	Sample Description:	<b>FIELD BLANK</b>	Chain of Custody:	<b>105666</b>
Client Project Name:	<b>Olivet Towers</b>	Sample No:	<b>16</b>	Collect Date:	<b>10/03/11</b>
Client Project No:	<b>062859.005</b>	Sample Matrix:	<b>Ground Water</b>	Collect Time:	<b>NA</b>

Sample Comments:

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable NN: Parameter not included in NELAC Scope of Analysis.

Volatile Organic Compounds (VOCs) by GC/MS (EPA 5030B/EPA 8260B)				Aliquot ID: 46662-016		Matrix: Ground Water		Analyst: CDH	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Acetone	U		µg/L	50	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
2. Acrylonitrile	U		µg/L	2.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
3. Benzene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
4. Bromobenzene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
5. Bromochloromethane	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
6. Bromodichloromethane	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
7. Bromoform	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
8. Bromomethane	U		µg/L	5.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
9. 2-Butanone	U		µg/L	25	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
10. n-Butylbenzene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
11. sec-Butylbenzene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
12. tert-Butylbenzene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
13. Carbon Disulfide	U		µg/L	5.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
14. Carbon Tetrachloride	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
15. Chlorobenzene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
16. Chloroethane	U		µg/L	5.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
17. Chloroform	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
18. Chloromethane	U		µg/L	5.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
19. 2-Chlorotoluene	U		µg/L	5.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
20. Dibromochloromethane	U		µg/L	5.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
21. 1,2-Dibromo-3-chloropropane (NN)	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
22. Dibromomethane	U		µg/L	5.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
23. 1,2-Dichlorobenzene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
24. 1,3-Dichlorobenzene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
25. 1,4-Dichlorobenzene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
26. Dichlorodifluoromethane	U		µg/L	5.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
27. 1,1-Dichloroethane	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
28. 1,2-Dichloroethane	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
29. 1,1-Dichloroethene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
30. cis-1,2-Dichloroethene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
31. trans-1,2-Dichloroethene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
32. 1,2-Dichloropropane	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
33. cis-1,3-Dichloropropene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
34. trans-1,3-Dichloropropene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
35. Ethylbenzene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
36. Ethylene Dibromide	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
37. 2-Hexanone	U		µg/L	50	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
38. Isopropylbenzene	U		µg/L	5.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
39. Methyl iodide	U		µg/L	5.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A

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Client Identification: <b>Soil and Materials Engineers, Inc. - Lansing</b>	Sample Description: <b>FIELD BLANK</b>	Chain of Custody: <b>105666</b>
Client Project Name: <b>Olivet Towers</b>	Sample No: <b>16</b>	Collect Date: <b>10/03/11</b>
Client Project No: <b>062859.005</b>	Sample Matrix: <b>Ground Water</b>	Collect Time: <b>NA</b>

Sample Comments:

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable NN: Parameter not included in NELAC Scope of Analysis.

Volatile Organic Compounds (VOCs) by GC/MS (EPA 5030B/EPA 8260B)				Aliquot ID: 46662-016		Matrix: Ground Water		Analyst: CDH	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
40. Methylene Chloride	U		µg/L	5.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
41. 2-Methylnaphthalene (NN)	U		µg/L	5.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
42. 4-Methyl-2-pentanone	U		µg/L	50	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
43. MTBE	U		µg/L	5.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
44. Naphthalene	U		µg/L	5.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
45. n-Propylbenzene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
46. Styrene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
47. 1,1,1,2-Tetrachloroethane	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
48. 1,1,2,2-Tetrachloroethane	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
49. Tetrachloroethene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
50. Toluene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
51. 1,2,4-Trichlorobenzene	U		µg/L	5.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
52. 1,1,1-Trichloroethane	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
53. 1,1,2-Trichloroethane	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
54. Trichloroethene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
55. Trichlorofluoromethane	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
56. 1,2,3-Trichloropropane	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
57. 1,2,3-Trimethylbenzene (NN)	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
58. 1,2,4-Trimethylbenzene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
59. 1,3,5-Trimethylbenzene	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
60. Vinyl Chloride	U		µg/L	1.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A
61. Xylenes	U		µg/L	3.0	1.0	10/05/11	VH11J05A	10/05/11	VH11J05A

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F: (810) 220-3311  
F: (231) 775-8584

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**Definitions/ Qualifiers:**

- A:** Spike recovery or precision unusable due to dilution.  
**B:** The analyte was detected in the associated method blank.  
**E:** The analyte was detected at a concentration greater than the calibration range, therefore the result is estimated.  
**J:** The concentration is an estimated value.  
**M:** Modified Method  
**U:** The analyte was not detected at or above the reporting limit.  
**X:** Matrix Interference has resulted in a raised reporting limit or distorted result.  
**W:** Results reported on a wet-weight basis.  
**\***: Value reported is outside QA limits

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**Exception Summary:**

- L-** : Recovery in the associated laboratory sample (LCS) exceeds the lower control limit. Results may be biased low.
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October 12, 2011

Case Narrative

Customer: SME

Project Identification: Olivet Towers/062859.005

Fibertec Project Number: 46662

Sample Collection/ Receipt

The following samples were collected on October 3, 2011 and received by Fibertec on October 4, 2011.

13 Soil Samples (1 sample on hold including an MS/MSD)

3 Water Samples (including blanks)

All samples were received on ice and in good condition.

Analysis

Analyses were conducted in accordance with chain of custody and within hold times.

All applicable quality assurance / quality control parameters were within acceptance limits unless otherwise noted.

PNAs

Samples 46662-002 (SB13-S1), 46662-003 (SB14-S2), 46662-004 (SB16-S1) 46662-008 (SB20-S2) and 46662-012 (SB10-S1) are estimated for anthracene, low laboratory control sample. Results may be biased low.

Sample data has been reviewed, and reported results remain valid.

Courtney Steel  
Authorized Signature

10-12-2011  
Date



**Analytical Laboratory**  
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Fax: 517 699 0388  
email: lab@iberc.us

**Analytical Laboratory**  
8660 S. Mackinaw Trail  
Cadillac, MI 49601  
Phone: 231 775 8368  
Fax: 231 775 8584

**Industrial Hygiene Services, Inc.**  
1914 Holloway Drive  
Holt, MI 48842  
Phone: 517 699 0345  
Fax: 517 699 0382  
email: [asbestos@ihbertec.us](mailto:asbestos@ihbertec.us)

**Geoprobe**  
11766 E. Grand River  
Brighton, MI 48116  
Phone: 810 220 3300  
Fax: 810 220 3311

Chain of Custody #  
105664  
PAGE 1 of 2

Client Name: SME					
Contact Person: J.P. Buckingham / Trent					
Project Name/ Number: Oliver Towers 0622859.005					
Purchase Order #					
Lab Sample #	Date	Time	Client Sample #	Client Sample Descriptor	MATRIX USE RIGHT CORNER FOR CODES
	10/3/10	11:40		SB 9-6W	2W4Y
		12:45		SB 13-SI	52Y
		1:10		SB 14-S2	1
		1:30		SB 16-SI	1
		2:10		SB 19-S5	1
		2:30		SB 17-S6	1
		2:50		SB 18-S2	1
		3:15		SB 20-S2	1
		11:00		SB 7-M5/msd	1
		-		Duplicate #1	1
Comments:					
Relinquished By: [Signature] Date/Time: 10/3/10 5:10 Received By: SME Call Story					
Relinquished By: [Signature] Date/Time: 10/4/11 Received By: C. Sweet					
Relinquished By: [Signature] Date/Time: 10/4/11 Received By: Laboratory					
LAB USE ONLY: Fibertec project number: Laboratory Tracking: Temperature at Receipt:					

TERMS &amp; CONDITIONS ON BACK

COC Revision: April, 2006

four



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email: lab@fibertec.us

Industrial Hygiene Services, Inc.  
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Fax: 517 699 0382  
email: asbestos@fibertec.us

Geoprobe  
11766 E. Grand River  
Brighton, MI 48116  
Phone: 810 220 3300  
Fax: 810 220 3311

Chain of Custody #  
105666  
PAGE 2 of 2

Client Name: SMC			
Contact Person: J.P. Buckner - front			
Project Name / Number:			
Purchase Order #			
Lab Sample #	Date	Time	Client Sample #
	10/3/11	3:40	SB10-51
	1	4:00	SB12-54
			Duplicate #2
			Field Blank
			Field Blank
Comments:			
Relinquished By: [Signature] Date/Time: 10/3/11 5:30 Received By: [Signature] Date/Time: 10/3/11 5:30			
Relinquished By: [Signature] Date/Time: 10/4/11 10:00 Received By: [Signature] Date/Time: 10/4/11 10:00			
Relinquished By: [Signature] Date/Time: 10/4/11 10:00 Received By: [Signature] Date/Time: 10/4/11 10:00			
LAB USE ONLY:			
Fibertec project number:			
Laboratory Tracking:			
Temperature at Receipt:			

PARAMETERS		Turnaround	Matrix Code
24 hour RUSH (surcharge applies)			S Soil
48 hour RUSH (surcharge applies)			W Water
72 hour RUSH (surcharge applies)			SW Surface Water
Standard (5-7 bus. days)			A Air
Other: Specify			WW Waste Water
			O Oil
			X Other: Specify
			P Wipe

MATRIX (SEE RIGHT CORNER FOR CODE)		# OF CONTAINERS	RESERVED (Y/N)	UOC	PAHs	10 mg M-L-B	PCBs	Lead	Remarks:
		5	2	Y	X	X	X	X	
		5	2	Y	X	X	X	X	
		5	2	Y	X	X	X	X	
		1	1	Y	X	X	X	X	
		1	1	Y	X	X	X	X	

COC Revision: April, 2006

TERMS & CONDITIONS ON BACK

-741

Friday, October 07, 2011

Fibertec Project Number: 46655  
Project Identification: Olivet Towers /062859.005  
Submittal Date: 10/04/2011

Mr. J.P. Buckingham  
Soil and Materials Engineers, Inc. - Lansing  
2663 Eaton Rapids Road  
Lansing, MI 48911

Dear Mr. Buckingham,

Thank you for selecting Fibertec Environmental Services as your analytical laboratory. The samples you submitted have been analyzed in accordance with NELAC standards and the results compiled in the attached report. Any exceptions to NELAC compliance are noted in the report. These results apply only to those samples submitted. Please note samples will be disposed of 30 days after reporting date.

If you have any questions regarding these results or if we may be of further assistance to you, please contact me at (517) 699-0345.

Sincerely,



Daryl P. Strandbergh  
Laboratory Director

DPS/kc

Enclosures



Client Identification:	<b>Soil and Materials Engineers, Inc. - Lansing</b>	Sample Description:	<b>SB1-S2</b>	Chain of Custody:	<b>105665</b>
Client Project Name:	<b>Olivet Towers</b>	Sample No:	<b>1</b>	Collect Date:	<b>10/03/11</b>
Client Project No:	<b>062859.005</b>	Sample Matrix:	<b>Soil/Solid</b>	Collect Time:	<b>08:20</b>
Sample Comments:	<b>Soil results have been calculated and reported on a dry weight basis unless otherwise noted.</b>				
Definitions:	Q: Qualifier (see definitions at end of report) NA: Not Applicable NN: Parameter not included in NELAC Scope of Analysis.				

Dry Weight Determination (ASTM D 2974-87)				Aliquot ID: 46655-001A		Matrix: Soil/Solid		Analyst: BMG	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Percent Moisture (Water Content) (NN)	<b>12</b>		%	<b>0.1</b>	1.0	10/05/11	MC111005	10/06/11	MC111005

Michigan 10 Elements by ICP/MS (EPA 0200.2-M/EPA 6020A)				Aliquot ID: 46655-001A		Matrix: Soil/Solid		Analyst: JLH	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Arsenic	<b>2800</b>		µg/kg	100	20	10/06/11	PT11J06B	10/06/11	T211J06A
2. Barium	<b>67000</b>		µg/kg	1000	20	10/06/11	PT11J06B	10/06/11	T211J06A
3. Cadmium	<b>440</b>		µg/kg	50	20	10/06/11	PT11J06B	10/06/11	T211J06A
4. Chromium	<b>11000</b>		µg/kg	500	20	10/06/11	PT11J06B	10/06/11	T211J06A
5. Copper	<b>18000</b>		µg/kg	1000	20	10/06/11	PT11J06B	10/06/11	T211J06A
6. Lead	<b>130000</b>		µg/kg	1000	20	10/06/11	PT11J06B	10/06/11	T211J06A
7. Selenium	<b>240</b>		µg/kg	200	20	10/06/11	PT11J06B	10/06/11	T211J06A
8. Silver	<b>240</b>		µg/kg	100	20	10/06/11	PT11J06B	10/06/11	T211J06A
9. Zinc	<b>120000</b>		µg/kg	1000	20	10/06/11	PT11J06B	10/06/11	T211J06A

Mercury by CVAAS (EPA 7471B)				Aliquot ID: 46655-001A		Matrix: Soil/Solid		Analyst: JLH	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Mercury	<b>U</b>		µg/kg	<b>50</b>	<b>10</b>	10/06/11	PM11J06E	10/06/11	M411J06E

Polynuclear Aromatic Hydrocarbons (PNAs) (EPA 3546/EPA 8270C)				Aliquot ID: 46655-001A		Matrix: Soil/Solid		Analyst: HLS	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Acenaphthene (SIM)	<b>U</b>		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
2. Acenaphthylene (SIM)	<b>U</b>		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
3. Anthracene (SIM)	<b>U</b>		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
4. Benzo(a)anthracene (SIM)	<b>U</b>		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
5. Benzo(a)pyrene (SIM)	<b>U</b>		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
6. Benzo(b)fluoranthene (SIM)	<b>U</b>		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
7. Benzo(ghi)perylene (SIM)	<b>U</b>		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
8. Benzo(k)fluoranthene (SIM)	<b>U</b>		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
9. Chrysene (SIM)	<b>U</b>		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
10. Dibenzo(a,h)anthracene (SIM)	<b>U</b>		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
11. Fluoranthene (SIM)	<b>420</b>		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
12. Fluorene (SIM)	<b>U</b>		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
13. Indeno(1,2,3-cd)pyrene (SIM)	<b>U</b>		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
14. 2-Methylnaphthalene (SIM)	<b>U</b>		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
15. Naphthalene (SIM)	<b>U</b>		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
16. Phenanthrene (SIM)	<b>U</b>		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
17. Pyrene (SIM)	<b>340</b>		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B

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Client Identification:	<b>Soil and Materials Engineers, Inc. - Lansing</b>	Sample Description:	<b>SB2-S1</b>	Chain of Custody:	<b>105665</b>
Client Project Name:	<b>Olivet Towers</b>	Sample No:	<b>2</b>	Collect Date:	<b>10/03/11</b>
Client Project No:	<b>062859.005</b>	Sample Matrix:	<b>Soil/Solid</b>	Collect Time:	<b>08:45</b>
Sample Comments:	<b>Soil results have been calculated and reported on a dry weight basis unless otherwise noted.</b>				
Definitions:	Q: Qualifier (see definitions at end of report) NA: Not Applicable NN: Parameter not included in NELAC Scope of Analysis.				

Dry Weight Determination (ASTM D 2974-87)				Aliquot ID: 46655-002A		Matrix: Soil/Solid		Analyst: BMG	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Percent Moisture (Water Content) (NN)	<b>12</b>		%	0.1	1.0	10/05/11	MC111005	10/06/11	MC111005

Michigan 10 Elements by ICP/MS (EPA 0200.2-M/EPA 6020A)				Aliquot ID: 46655-002A		Matrix: Soil/Solid		Analyst: JLH	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Arsenic	<b>4600</b>		µg/kg	100	20	10/06/11	PT11J06B	10/06/11	T211J06A
2. Barium	<b>83000</b>		µg/kg	1000	20	10/06/11	PT11J06B	10/06/11	T211J06A
3. Cadmium	<b>370</b>		µg/kg	50	20	10/06/11	PT11J06B	10/06/11	T211J06A
4. Chromium	<b>13000</b>		µg/kg	500	20	10/06/11	PT11J06B	10/06/11	T211J06A
5. Copper	<b>15000</b>		µg/kg	1000	20	10/06/11	PT11J06B	10/06/11	T211J06A
6. Lead	<b>71000</b>		µg/kg	1000	20	10/06/11	PT11J06B	10/06/11	T211J06A
7. Selenium	<b>220</b>		µg/kg	200	20	10/06/11	PT11J06B	10/06/11	T211J06A
8. Silver	<b>U</b>		µg/kg	100	20	10/06/11	PT11J06B	10/06/11	T211J06A
9. Zinc	<b>85000</b>		µg/kg	1000	20	10/06/11	PT11J06B	10/06/11	T211J06A

Mercury by CVAAS (EPA 7471B)				Aliquot ID: 46655-002A		Matrix: Soil/Solid		Analyst: JLH	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Mercury	<b>160</b>		µg/kg	50	10	10/06/11	PM11J06E	10/06/11	M411J06E

Polynuclear Aromatic Hydrocarbons (PNAs) (EPA 3546/EPA 8270C)				Aliquot ID: 46655-002A		Matrix: Soil/Solid		Analyst: HLS	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Acenaphthene (SIM)	<b>U</b>		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
2. Acenaphthylene (SIM)	<b>U</b>		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
3. Anthracene (SIM)	<b>U</b>		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
4. Benzo(a)anthracene (SIM)	<b>U</b>		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
5. Benzo(a)pyrene (SIM)	<b>U</b>		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
6. Benzo(b)fluoranthene (SIM)	<b>U</b>		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
7. Benzo(ghi)perylene (SIM)	<b>U</b>		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
8. Benzo(k)fluoranthene (SIM)	<b>U</b>		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
9. Chrysene (SIM)	<b>U</b>		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
10. Dibenzo(a,h)anthracene (SIM)	<b>U</b>		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
11. Fluoranthene (SIM)	<b>U</b>		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
12. Fluorene (SIM)	<b>U</b>		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
13. Indeno(1,2,3-cd)pyrene (SIM)	<b>U</b>		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
14. 2-Methylnaphthalene (SIM)	<b>U</b>		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
15. Naphthalene (SIM)	<b>U</b>		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
16. Phenanthrene (SIM)	<b>U</b>		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
17. Pyrene (SIM)	<b>U</b>		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B

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F: (231) 775-8584

Client Identification:	<b>Soil and Materials Engineers, Inc. - Lansing</b>	Sample Description:	<b>SB3-S1</b>	Chain of Custody:	<b>105665</b>
Client Project Name:	<b>Olivet Towers</b>	Sample No:	<b>3</b>	Collect Date:	<b>10/03/11</b>
Client Project No:	<b>062859.005</b>	Sample Matrix:	<b>Soil/Solid</b>	Collect Time:	<b>09:10</b>
Sample Comments:	<b>Soil results have been calculated and reported on a dry weight basis unless otherwise noted.</b>				
Definitions:	Q: Qualifier (see definitions at end of report) NA: Not Applicable NN: Parameter not included in NELAC Scope of Analysis.				

Dry Weight Determination (ASTM D 2974-87)				Aliquot ID: 46655-003A		Matrix: Soil/Solid		Analyst: BMG	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Percent Moisture (Water Content) (NN)	<b>6.3</b>		%	0.1	1.0	10/05/11	MC111005	10/06/11	MC111005

Michigan 10 Elements by ICP/MS (EPA 0200.2-M/EPA 6020A)				Aliquot ID: 46655-003A		Matrix: Soil/Solid		Analyst: JLH	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Arsenic	<b>3300</b>		µg/kg	100	20	10/06/11	PT11J06B	10/06/11	T211J06A
2. Barium	<b>19000</b>		µg/kg	1000	20	10/06/11	PT11J06B	10/06/11	T211J06A
3. Cadmium	<b>80</b>		µg/kg	50	20	10/06/11	PT11J06B	10/06/11	T211J06A
4. Chromium	<b>4200</b>		µg/kg	500	20	10/06/11	PT11J06B	10/06/11	T211J06A
5. Copper	<b>6200</b>		µg/kg	1000	20	10/06/11	PT11J06B	10/06/11	T211J06A
6. Lead	<b>8100</b>		µg/kg	1000	20	10/06/11	PT11J06B	10/06/11	T211J06A
7. Selenium	U		µg/kg	200	20	10/06/11	PT11J06B	10/06/11	T211J06A
8. Silver	U		µg/kg	100	20	10/06/11	PT11J06B	10/06/11	T211J06A
9. Zinc	<b>21000</b>		µg/kg	1000	20	10/06/11	PT11J06B	10/06/11	T211J06A

Mercury by CVAAS (EPA 7471B)				Aliquot ID: 46655-003A		Matrix: Soil/Solid		Analyst: JLH	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Mercury	<b>250</b>		µg/kg	50	10	10/06/11	PM11J06E	10/06/11	M411J06E

Polynuclear Aromatic Hydrocarbons (PNAs) (EPA 3546/EPA 8270C)				Aliquot ID: 46655-003A		Matrix: Soil/Solid		Analyst: HLS	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Acenaphthene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
2. Acenaphthylene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
3. Anthracene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
4. Benzo(a)anthracene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
5. Benzo(a)pyrene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
6. Benzo(b)fluoranthene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
7. Benzo(ghi)perylene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
8. Benzo(k)fluoranthene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
9. Chrysene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
10. Dibenzo(a,h)anthracene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
11. Fluoranthene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
12. Fluorene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
13. Indeno(1,2,3-cd)pyrene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
14. 2-Methylnaphthalene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
15. Naphthalene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
16. Phenanthrene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
17. Pyrene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B

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Client Identification:	<b>Soil and Materials Engineers, Inc. - Lansing</b>	Sample Description:	<b>SB4-S1</b>	Chain of Custody:	<b>105665</b>
Client Project Name:	<b>Olivet Towers</b>	Sample No:	<b>4</b>	Collect Date:	<b>10/03/11</b>
Client Project No:	<b>062859.005</b>	Sample Matrix:	<b>Soil/Solid</b>	Collect Time:	<b>09:35</b>
Sample Comments:	<b>Soil results have been calculated and reported on a dry weight basis unless otherwise noted.</b>				
Definitions:	Q: Qualifier (see definitions at end of report) NA: Not Applicable NN: Parameter not included in NELAC Scope of Analysis.				

Dry Weight Determination (ASTM D 2974-87)				Aliquot ID: 46655-004A		Matrix: Soil/Solid		Analyst: BMG	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Percent Moisture (Water Content) (NN)	<b>7.1</b>		%	0.1	1.0	10/05/11	MC111005	10/06/11	MC111005

Michigan 10 Elements by ICP/MS (EPA 0200.2-M/EPA 6020A)				Aliquot ID: 46655-004A		Matrix: Soil/Solid		Analyst: JLH	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Arsenic	<b>3000</b>		µg/kg	100	20	10/06/11	PT11J06B	10/06/11	T211J06A
2. Barium	<b>20000</b>		µg/kg	1000	20	10/06/11	PT11J06B	10/06/11	T211J06A
3. Cadmium	<b>88</b>		µg/kg	50	20	10/06/11	PT11J06B	10/06/11	T211J06A
4. Chromium	<b>6000</b>		µg/kg	500	20	10/06/11	PT11J06B	10/06/11	T211J06A
5. Copper	<b>6900</b>		µg/kg	1000	20	10/06/11	PT11J06B	10/06/11	T211J06A
6. Lead	<b>8000</b>		µg/kg	1000	20	10/06/11	PT11J06B	10/06/11	T211J06A
7. Selenium	U		µg/kg	200	20	10/06/11	PT11J06B	10/06/11	T211J06A
8. Silver	U		µg/kg	100	20	10/06/11	PT11J06B	10/06/11	T211J06A
9. Zinc	<b>23000</b>		µg/kg	1000	20	10/06/11	PT11J06B	10/06/11	T211J06A

Mercury by CVAAS (EPA 7471B)				Aliquot ID: 46655-004A		Matrix: Soil/Solid		Analyst: JLH	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Mercury	<b>140</b>		µg/kg	50	10	10/06/11	PM11J06E	10/06/11	M411J06E

Polynuclear Aromatic Hydrocarbons (PNAs) (EPA 3546/EPA 8270C)				Aliquot ID: 46655-004A		Matrix: Soil/Solid		Analyst: HLS	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Acenaphthene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
2. Acenaphthylene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
3. Anthracene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
4. Benzo(a)anthracene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
5. Benzo(a)pyrene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
6. Benzo(b)fluoranthene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
7. Benzo(ghi)perylene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
8. Benzo(k)fluoranthene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
9. Chrysene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
10. Dibenzo(a,h)anthracene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
11. Fluoranthene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
12. Fluorene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
13. Indeno(1,2,3-cd)pyrene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
14. 2-Methylnaphthalene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
15. Naphthalene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
16. Phenanthrene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
17. Pyrene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B

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Client Identification:	Soil and Materials Engineers, Inc. - Lansing	Sample Description:	SB5-S1	Chain of Custody:	105665
Client Project Name:	Olivet Towers	Sample No:	6	Collect Date:	10/03/11
Client Project No:	062859.005	Sample Matrix:	Soil/Solid	Collect Time:	10:15
Sample Comments:	Soil results have been calculated and reported on a dry weight basis unless otherwise noted.				
Definitions:	Q: Qualifier (see definitions at end of report) NA: Not Applicable NN: Parameter not included in NELAC Scope of Analysis.				

Dry Weight Determination (ASTM D 2974-87)				Aliquot ID: 46655-006		Matrix: Soil/Solid		Analyst: BMG	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Percent Moisture (Water Content) (NN)	6.0		%	0.1	1.0	10/05/11	MC111005	10/06/11	MC111005

Michigan 10 Elements by ICP/MS (EPA 0200.2-M/EPA 6020A)				Aliquot ID: 46655-006		Matrix: Soil/Solid		Analyst: JLH	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Arsenic	7600		µg/kg	100	20	10/06/11	PT11J06B	10/06/11	T211J06A
2. Barium	34000		µg/kg	1000	20	10/06/11	PT11J06B	10/06/11	T211J06A
3. Cadmium	120		µg/kg	50	20	10/06/11	PT11J06B	10/06/11	T211J06A
4. Chromium	5800		µg/kg	500	20	10/06/11	PT11J06B	10/06/11	T211J06A
5. Copper	6400		µg/kg	1000	20	10/06/11	PT11J06B	10/06/11	T211J06A
6. Lead	7700		µg/kg	1000	20	10/06/11	PT11J06B	10/06/11	T211J06A
7. Selenium	U		µg/kg	200	20	10/06/11	PT11J06B	10/06/11	T211J06A
8. Silver	U		µg/kg	100	20	10/06/11	PT11J06B	10/06/11	T211J06A
9. Zinc	21000		µg/kg	1000	20	10/06/11	PT11J06B	10/06/11	T211J06A

Mercury by CVAAS (EPA 7471B)				Aliquot ID: 46655-006		Matrix: Soil/Solid		Analyst: JLH	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Mercury	220		µg/kg	50	10	10/06/11	PM11J06E	10/06/11	M411J06E

Polynuclear Aromatic Hydrocarbons (PNAs) (EPA 3546/EPA 8270C)				Aliquot ID: 46655-006		Matrix: Soil/Solid		Analyst: HLS	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Acenaphthene (SIM)	U		µg/kg	330	20	10/06/11	PS11J06B	10/07/11	S611J06B
2. Acenaphthylene (SIM)	U		µg/kg	330	20	10/06/11	PS11J06B	10/07/11	S611J06B
3. Anthracene (SIM)	U		µg/kg	330	20	10/06/11	PS11J06B	10/07/11	S611J06B
4. Benzo(a)anthracene (SIM)	U		µg/kg	330	20	10/06/11	PS11J06B	10/07/11	S611J06B
5. Benzo(a)pyrene (SIM)	U		µg/kg	330	20	10/06/11	PS11J06B	10/07/11	S611J06B
6. Benzo(b)fluoranthene (SIM)	U		µg/kg	330	20	10/06/11	PS11J06B	10/07/11	S611J06B
7. Benzo(ghi)perylene (SIM)	U		µg/kg	330	20	10/06/11	PS11J06B	10/07/11	S611J06B
8. Benzo(k)fluoranthene (SIM)	U		µg/kg	330	20	10/06/11	PS11J06B	10/07/11	S611J06B
9. Chrysene (SIM)	U		µg/kg	330	20	10/06/11	PS11J06B	10/07/11	S611J06B
10. Dibenzo(a,h)anthracene (SIM)	U		µg/kg	330	20	10/06/11	PS11J06B	10/07/11	S611J06B
11. Fluoranthene (SIM)	U		µg/kg	330	20	10/06/11	PS11J06B	10/07/11	S611J06B
12. Fluorene (SIM)	U		µg/kg	330	20	10/06/11	PS11J06B	10/07/11	S611J06B
13. Indeno(1,2,3-cd)pyrene (SIM)	U		µg/kg	330	20	10/06/11	PS11J06B	10/07/11	S611J06B
14. 2-Methylnaphthalene (SIM)	U		µg/kg	330	20	10/06/11	PS11J06B	10/07/11	S611J06B
15. Naphthalene (SIM)	U		µg/kg	330	20	10/06/11	PS11J06B	10/07/11	S611J06B
16. Phenanthrene (SIM)	U		µg/kg	330	20	10/06/11	PS11J06B	10/07/11	S611J06B
17. Pyrene (SIM)	U		µg/kg	330	20	10/06/11	PS11J06B	10/07/11	S611J06B

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Client Identification:	Soil and Materials Engineers, Inc. - Lansing	Sample Description:	SB6-S1	Chain of Custody:	105665
Client Project Name:	Olivet Towers	Sample No:	7	Collect Date:	10/03/11
Client Project No:	062859.005	Sample Matrix:	Soil/Solid	Collect Time:	10:30
Sample Comments:	Soil results have been calculated and reported on a dry weight basis unless otherwise noted.				
Definitions:	Q: Qualifier (see definitions at end of report) NA: Not Applicable NN: Parameter not included in NELAC Scope of Analysis.				

Dry Weight Determination (ASTM D 2974-87)				Aliquot ID: 46655-007		Matrix: Soil/Solid		Analyst: BMG	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Percent Moisture (Water Content) (NN)	13		%	0.1	1.0	10/05/11	MC111005	10/06/11	MC111005

Michigan 10 Elements by ICP/MS (EPA 0200.2-M/EPA 6020A)				Aliquot ID: 46655-007		Matrix: Soil/Solid		Analyst: JLH	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Arsenic	3200		µg/kg	100	20	10/06/11	PT11J06B	10/06/11	T211J06A
2. Barium	110000		µg/kg	1000	20	10/06/11	PT11J06B	10/06/11	T211J06A
3. Cadmium	220		µg/kg	50	20	10/06/11	PT11J06B	10/06/11	T211J06A
4. Chromium	13000		µg/kg	500	20	10/06/11	PT11J06B	10/06/11	T211J06A
5. Copper	27000		µg/kg	1000	20	10/06/11	PT11J06B	10/06/11	T211J06A
6. Lead	270000		µg/kg	1000	200	10/06/11	PT11J06B	10/06/11	T211J06A
7. Selenium	230		µg/kg	200	20	10/06/11	PT11J06B	10/06/11	T211J06A
8. Silver	130		µg/kg	100	20	10/06/11	PT11J06B	10/06/11	T211J06A
9. Zinc	170000		µg/kg	1000	20	10/06/11	PT11J06B	10/06/11	T211J06A

Mercury by CVAAS (EPA 7471B)				Aliquot ID: 46655-007		Matrix: Soil/Solid		Analyst: JLH	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Mercury	120		µg/kg	50	10	10/06/11	PM11J06E	10/06/11	M411J06E

Polynuclear Aromatic Hydrocarbons (PNAs) (EPA 3546/EPA 8270C)				Aliquot ID: 46655-007		Matrix: Soil/Solid		Analyst: HLS	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Acenaphthene (SIM)	U		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
2. Acenaphthylene (SIM)	U		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
3. Anthracene (SIM)	U		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
4. Benzo(a)anthracene (SIM)	490		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
5. Benzo(a)pyrene (SIM)	370		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
6. Benzo(b)fluoranthene (SIM)	520		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
7. Benzo(ghi)perylene (SIM)	U		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
8. Benzo(k)fluoranthene (SIM)	U		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
9. Chrysene (SIM)	370		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
10. Dibenzo(a,h)anthracene (SIM)	U		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
11. Fluoranthene (SIM)	710		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
12. Fluorene (SIM)	U		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
13. Indeno(1,2,3-cd)pyrene (SIM)	U		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
14. 2-Methylnaphthalene (SIM)	U		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
15. Naphthalene (SIM)	U		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
16. Phenanthrene (SIM)	340		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B
17. Pyrene (SIM)	590		µg/kg	330	20	10/06/11	PS11J06B	10/06/11	S611J06B

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Client Identification:	Soil and Materials Engineers, Inc. - Lansing	Sample Description:	SB7-S2	Chain of Custody:	105665
Client Project Name:	Olivet Towers	Sample No:	8	Collect Date:	10/03/11
Client Project No:	062859.005	Sample Matrix:	Soil/Solid	Collect Time:	11:00
Sample Comments:	Soil results have been calculated and reported on a dry weight basis unless otherwise noted.				
Definitions:	Q: Qualifier (see definitions at end of report) NA: Not Applicable NN: Parameter not included in NELAC Scope of Analysis.				

Dry Weight Determination (ASTM D 2974-87)				Aliquot ID: 46655-008		Matrix: Soil/Solid		Analyst: BMG	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Percent Moisture (Water Content) (NN)	17		%	0.1	1.0	10/05/11	MC111005	10/06/11	MC111005

Michigan 10 Elements by ICP/MS (EPA 0200.2-M/EPA 6020A)				Aliquot ID: 46655-008		Matrix: Soil/Solid		Analyst: JLH	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Arsenic	6200		µg/kg	100	20	10/06/11	PT11J06B	10/06/11	T211J06A
2. Barium	120000		µg/kg	1000	20	10/06/11	PT11J06B	10/06/11	T211J06A
3. Cadmium	440		µg/kg	50	20	10/06/11	PT11J06B	10/06/11	T211J06A
4. Chromium	11000		µg/kg	500	20	10/06/11	PT11J06B	10/06/11	T211J06A
5. Copper	16000		µg/kg	1000	20	10/06/11	PT11J06B	10/06/11	T211J06A
6. Lead	160000		µg/kg	1000	20	10/06/11	PT11J06B	10/06/11	T211J06A
7. Selenium	290		µg/kg	200	20	10/06/11	PT11J06B	10/06/11	T211J06A
8. Silver	140		µg/kg	100	20	10/06/11	PT11J06B	10/06/11	T211J06A
9. Zinc	210000		µg/kg	1000	20	10/06/11	PT11J06B	10/06/11	T211J06A

Mercury by CVAAS (EPA 7471B)				Aliquot ID: 46655-008		Matrix: Soil/Solid		Analyst: JLH	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Mercury	U		µg/kg	50	10	10/06/11	PM11J06E	10/06/11	M411J06E

Polynuclear Aromatic Hydrocarbons (PNAs) (EPA 3546/EPA 8270C)				Aliquot ID: 46655-008		Matrix: Soil/Solid		Analyst: HLS	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Acenaphthene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
2. Acenaphthylene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
3. Anthracene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
4. Benzo(a)anthracene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
5. Benzo(a)pyrene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
6. Benzo(b)fluoranthene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
7. Benzo(ghi)perylene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
8. Benzo(k)fluoranthene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
9. Chrysene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
10. Dibenzo(a,h)anthracene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
11. Fluoranthene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
12. Fluorene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
13. Indeno(1,2,3-cd)pyrene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
14. 2-Methylnaphthalene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
15. Naphthalene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
16. Phenanthrene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
17. Pyrene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B

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Client Identification:	Soil and Materials Engineers, Inc. - Lansing	Sample Description:	SB8-S2	Chain of Custody:	105665
Client Project Name:	Olivet Towers	Sample No:	9	Collect Date:	10/03/11
Client Project No:	062859.005	Sample Matrix:	Soil/Solid	Collect Time:	12:15
Sample Comments:	Soil results have been calculated and reported on a dry weight basis unless otherwise noted.				
Definitions:	Q: Qualifier (see definitions at end of report) NA: Not Applicable NN: Parameter not included in NELAC Scope of Analysis.				

Dry Weight Determination (ASTM D 2974-87)				Aliquot ID: 46655-009		Matrix: Soil/Solid		Analyst: BMG	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Percent Moisture (Water Content) (NN)	12		%	0.1	1.0	10/05/11	MC111005	10/06/11	MC111005

Michigan 10 Elements by ICP/MS (EPA 0200.2-M/EPA 6020A)				Aliquot ID: 46655-009		Matrix: Soil/Solid		Analyst: JLH	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Arsenic	3900		µg/kg	100	20	10/06/11	PT11J06B	10/06/11	T211J06A
2. Barium	70000		µg/kg	1000	20	10/06/11	PT11J06B	10/06/11	T211J06A
3. Cadmium	260		µg/kg	50	20	10/06/11	PT11J06B	10/06/11	T211J06A
4. Chromium	12000		µg/kg	500	20	10/06/11	PT11J06B	10/06/11	T211J06A
5. Copper	15000		µg/kg	1000	20	10/06/11	PT11J06B	10/06/11	T211J06A
6. Lead	39000		µg/kg	1000	20	10/06/11	PT11J06B	10/06/11	T211J06A
7. Selenium	430		µg/kg	200	10	10/06/11	PT11J06B	10/06/11	T211J06A
8. Silver	U		µg/kg	100	20	10/06/11	PT11J06B	10/06/11	T211J06A
9. Zinc	82000		µg/kg	1000	20	10/06/11	PT11J06B	10/06/11	T211J06A

Mercury by CVAAS (EPA 7471B)				Aliquot ID: 46655-009		Matrix: Soil/Solid		Analyst: JLH	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Mercury	110		µg/kg	50	10	10/06/11	PM11J06E	10/06/11	M411J06E

Polynuclear Aromatic Hydrocarbons (PNAs) (EPA 3546/EPA 8270C)				Aliquot ID: 46655-009		Matrix: Soil/Solid		Analyst: HLS	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Acenaphthene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
2. Acenaphthylene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
3. Anthracene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
4. Benzo(a)anthracene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
5. Benzo(a)pyrene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
6. Benzo(b)fluoranthene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
7. Benzo(ghi)perylene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
8. Benzo(k)fluoranthene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
9. Chrysene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
10. Dibenzo(a,h)anthracene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
11. Fluoranthene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
12. Fluorene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
13. Indeno(1,2,3-cd)pyrene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
14. 2-Methylnaphthalene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
15. Naphthalene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
16. Phenanthrene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B
17. Pyrene	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S711J06B

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Client Identification:	Soil and Materials Engineers, Inc. - Lansing	Sample Description:	SB9-S1	Chain of Custody:	105665
Client Project Name:	Olivet Towers	Sample No:	10	Collect Date:	10/03/11
Client Project No:	062859.005	Sample Matrix:	Soil/Solid	Collect Time:	11:20
Sample Comments:	Soil results have been calculated and reported on a dry weight basis unless otherwise noted.				
Definitions:	Q: Qualifier (see definitions at end of report) NA: Not Applicable NN: Parameter not included in NELAC Scope of Analysis.				

Dry Weight Determination (ASTM D 2974-87)				Aliquot ID: 46655-010A		Matrix: Soil/Solid		Analyst: BMG	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Percent Moisture (Water Content) (NN)	16		%	0.1	1.0	10/05/11	MC111005	10/06/11	MC111005

Michigan 10 Elements by ICP/MS (EPA 0200.2-M/EPA 6020A)				Aliquot ID: 46655-010A		Matrix: Soil/Solid		Analyst: JLH	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Arsenic	4300		µg/kg	100	20	10/06/11	PT11J06B	10/06/11	T211J06A
2. Barium	78000		µg/kg	1000	20	10/06/11	PT11J06B	10/06/11	T211J06A
3. Cadmium	320		µg/kg	50	20	10/06/11	PT11J06B	10/06/11	T211J06A
4. Chromium	9100		µg/kg	500	20	10/06/11	PT11J06B	10/06/11	T211J06A
5. Copper	18000		µg/kg	1000	20	10/06/11	PT11J06B	10/06/11	T211J06A
6. Lead	86000		µg/kg	1000	20	10/06/11	PT11J06B	10/06/11	T211J06A
7. Selenium	600		µg/kg	200	20	10/06/11	PT11J06B	10/06/11	T211J06A
8. Silver	140		µg/kg	100	20	10/06/11	PT11J06B	10/06/11	T211J06A
9. Zinc	85000		µg/kg	1000	20	10/06/11	PT11J06B	10/06/11	T211J06A

Mercury by CVAAS (EPA 7471B)				Aliquot ID: 46655-010A		Matrix: Soil/Solid		Analyst: JLH	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Mercury	U		µg/kg	50	10	10/06/11	PM11J06E	10/06/11	M411J06E

Polynuclear Aromatic Hydrocarbons (PNAs) (EPA 3546/EPA 8270C)				Aliquot ID: 46655-010A		Matrix: Soil/Solid		Analyst: HLS	
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Acenaphthene (SIM)	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S611J06B
2. Acenaphthylene (SIM)	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S611J06B
3. Anthracene (SIM)	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S611J06B
4. Benzo(a)anthracene (SIM)	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S611J06B
5. Benzo(a)pyrene (SIM)	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S611J06B
6. Benzo(b)fluoranthene (SIM)	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S611J06B
7. Benzo(ghi)perylene (SIM)	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S611J06B
8. Benzo(k)fluoranthene (SIM)	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S611J06B
9. Chrysene (SIM)	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S611J06B
10. Dibenzo(a,h)anthracene (SIM)	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S611J06B
11. Fluoranthene (SIM)	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S611J06B
12. Fluorene (SIM)	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S611J06B
13. Indeno(1,2,3-cd)pyrene (SIM)	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S611J06B
14. 2-Methylnaphthalene (SIM)	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S611J06B
15. Naphthalene (SIM)	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S611J06B
16. Phenanthrene (SIM)	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S611J06B
17. Pyrene (SIM)	U		µg/kg	330	1.0	10/06/11	PS11J06B	10/06/11	S611J06B

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**Definitions/ Qualifiers:**

- A:** Spike recovery or precision unusable due to dilution.  
**B:** The analyte was detected in the associated method blank.  
**E:** The analyte was detected at a concentration greater than the calibration range, therefore the result is estimated.  
**J:** The concentration is an estimated value.  
**M:** Modified Method  
**U:** The analyte was not detected at or above the reporting limit.  
**X:** Matrix Interference has resulted in a raised reporting limit or distorted result.  
**W:** Results reported on a wet-weight basis.  
**\*:** Value reported is outside QA limits
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**Exception Summary:**

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October 7, 2011

Case Narrative

Customer: SME

Project Identification: Oliver Towers/062859.005

Fibertec Project Number: 46655

Sample Collection/ Receipt

The following samples were collected on October 3, 2011 and received by Fibertec on October 4, 2011.

10 Soil Sample (1 sample on hold)

All samples were received on ice and in good condition.

Analysis

Analyses were conducted in accordance with chain of custody and within hold times.

All applicable quality assurance / quality control parameters were within acceptance limits unless otherwise noted.

Sample data has been reviewed, and reported results remain valid.

Courtney Steel  
Authorized Signature

10-7-11  
Date



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Industrial Hygiene Services, Inc.  
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email: asbestos@fibertec.us

Geoprobe  
11766 E. Grand River  
Brighton, MI 48116  
Phone: 810 220 3300  
Fax: 810 220 3311

Chain of Custody #  
105665  
PAGE 1 of 1

Client Name: <u>SMC</u>			Turnaround			Matrix Code					
Contact Person: <u>J.P. Buckingham/Trent</u>			24 hour RUSH (surcharge applies)			S Soil			GW Ground Water		
Project Name/ Number: <u>01-over Towers</u>			48 hour RUSH (surcharge applies)			W Water			SW Surface Water		
Purchase Order# <u>062859.005</u>			72 hour RUSH (surcharge applies)			A Air			WW Waste Water		
			Standard (5-7 bus days)			O Oil			Other: Specify		
			<input checked="" type="checkbox"/> Other: Specify			P Wipe					
Matrix (see right corner for code)			PRESERVED (Y/N)								
# OF CONTAINERS											
Lab Sample #			Client Sample #			Client Sample Descriptor					
10/3/11 8:20			SB1-S2								
8:45			SB2-S1								
9:10			SB3-S1								
9:35			SB4-S1								
9:50			SB4-S5								
10:15			SB5-S1								
10:30			SB6-S1								
11:00			SB7-S2								
12:15			SB8-S2								
11:20			SB9-S1								
Comments:											
Relinquished By: <u>[Signature]</u>			Date/Time: <u>10/3/11</u>			Received By: <u>SMC Lab Staff</u>					
Relinquished By: <u>[Signature]</u>			Date/Time: <u>10/4/11</u>			Received By: <u>[Signature]</u>					
Relinquished By: <u>[Signature]</u>			Date/Time: <u>10/4/11</u>			Received By: <u>[Signature]</u>					
LAB USE ONLY:											
Fibertec project number:											
Laboratory Tracking:											
Temperature at Receipt:											

COC Revision: April, 2006

TERMS & CONDITIONS ON BACK

U10655

07.11.11